Elucidating the Relationship between Psychopathic Personality Traits and Fearlessness: A Reconsideration of the Low-fear Hypothesis

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Abstract

Deficits in fear have long been posited as an important etiological factor in the development of psychopathy, a personality disorder characterized by severe interpersonal and social impairments masked by an outward appearance of superficial affability. While there has been much empirical evidence establishing a link between psychopathy and deficits in fear, there are still many questions regarding the nature of this association and much ongoing debate surrounding the conceptualization of psychopathy and demarcation of fear into conscious and unconscious components. The current study examined the association between various theoretical models of psychopathy and different dimensons of fear in order to elucidate the relationship between psychopathic traits and fearlessness. Self-report and informant-report responses were collected on a battery of psychopathy and fear related measures in a mixed student and community sample (N = 305). Analysis of the fear measures revealed two higher order dimensions labeled 'Danger Seeking' and 'Affective Fearlessness', which were differently associated with different psychopathy trait domains. Overall, Danger Seeking was associated with most psychopathy domains across conceptual models, but Affective Fearlessness was only significantly associated with emotional stability features, suggesting that fear deficits in psychopathy may not extend to reduced emotional experience of fear. The current findings have implications for etiological theories of psychopathy, and future research should investigate further the relationship between psychopathy and different components of fear.

Keywords: psychopathy, fearlessness, low-fear hypothesis, emotion

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Introduction

Psychopathy is a personality disorder characterized by serious interpersonal and social impairments (Cooke & Logan, 2018; Hare, Neumann, & Morkos, 2018; Lilienfeld & Andrews, 1996; Patrick, Fowles, & Krueger, 2009). The estimated prevalence of psychopathy in the general population is 1%, and the estimated prevalence in prison populations is 25% (Hare, 2003). Emotional deficits have long been considered a central characteristic of the disorder. However, there has been considerable contemporary debate surrounding the role of emotional deficits in psychopathy. In particular, there has been debate over Lykken's (1995) low-fear hypothesis, which posited that an absence of fear was the core etiological factor in psychopathy (Hamilton & Newman, 2018; Newman & Baskin-Sommers, 2012). While there has been much empirical evidence establishing a link between psychopathy and deficits in fear responding, there are still many questions regarding the nature of this association given the ongoing disagreements over the conceptualization and assessment of psychopathy and developments in the delineation of fear (Blackburn, 1998; Blair, 2008; Hare & Quinn, 1971; Hoppenbrouwers, Bulten, & Brazil, 2016; Lykken, 1957; Patrick, 2001; Patrick, Cuthbert, & Lang, 1994; Yang & Raine, 2018; Skeem, Polaschek, Patrick, & Lilienfeld, 2011).

The primary objective of the current study was thus to examine the association between various theoretical models of psychopathy and fear in order to explicate the relationship between these constructs. The secondary objective was to explore how different aspects of fear were associated with psychopathy in order to reassess the low-fear hypothesis in accordance with contemporary conceptualizations of both fear and psychopathy. The following review thus (a) provides an overview of historical and contemporary perspectives on psychopathy in order to elucidate the construct, (b) delineates contemporary conceptualizations of fear, and (c)

summarizes the theoretical and empirical findings supporting the association between psychopathy and deficits in fear.

What is psychopathy?

The 'psychopath' has long held the public's imagination and fascination and has evoked images of slick talking but deadly movie villains and infamous serial killers and con artists (e.g., Hannibal Lecter from the movie, *Silence of the Lambs*, Villanelle from the TV show, *Killing Eve*, serial killer Ted Bundy, and financial fraudster Bernie Madoff). However, while most people are familiar with the term "psychopath", few are aware of what psychopathy actually entails. In the clinical nosology, psychopathy has been classified as a personality disorder. Yet despite being one of the most studied personality pathologies, garnering long standing interest from clinical, academic, and forensic researches alike, psychopathy continues to be a topic of much debate. In order to elucidate the construct of psychopathy, the following section has provided (a) an overview of core psychopathic traits, (b) a review of historical perspectives, (c) a summary of contemporary models and measures, and (d) a brief discussion of prominent controversies within the field.

Defining personality. Personality has been defined as the characteristic way an individual thinks, feels, and acts and is largely stable across time and situation (Widiger, 2012). Personality traits have been defined as enduring patterns of thinking, perceiving, and relating and can be understood as sub-components along which personality can be divided and described (DSM-5; American Psychiatric Association [APA], 2013, p. 647; Lynam, Miller, & Derefinko, 2018). Differences in personality can thus be conceptualized as individual variations in trait manifestations and can be described by differing trait configurations (Widiger, Samuel, Mullins-Sweatt, Gore, and Crego, 2012). Traits can be further organized and reduced into general or

overarching domains to produce structural models of personality. Dominant models of personality have included Tellegen's three factor model (Positive Emotionality, Negative Emotionality, and Constraint), Eysenck's PEN model (Psychoticism, Extraversion, and Neuroticism), and the Big Five or Five Factor Model (Neuroticism vs. Emotional Stability, Extraversion vs. Introversion, Openness to Experience, Agreeableness vs. Antagonism, and Conscientiousness) (Costa & McCrae, 1992; Eysenck, 1981; Tellegen & Waller, 2008; Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993).

Personality disorders. A personality disorder (PD) has been defined as an inflexible and pervasive pattern of thinking, feeling, and behaving that deviates from social norms, beginning in adolescence or early adulthood, that causes impairment or distress (APA, 2013, p. 645). At the core of personality pathology are disturbances in self (identity and self-direction) and interpersonal (empathy and intimacy) functioning (APA, 2013, p. 762). Traditional PD conceptualizations posited that there were discrete PD types or categories defined by particular and separable trait configurations distinct from normal personality (Skodal, 2012). The DSM has been a proponent of the categorical system until recently and still has ten PDs presently listed, which includes the DSM's psychopathy diagnosis, Antisocial Personality Disorder (ASPD) (APA, 2013, p.659). However, the validity of the categorical system has not been supported by research, which has led to an increase in support for dimensional models of personality pathology (Skodal, 2012). Currently, the DSM-5 has included an alternative model of personality disorders in its Emerging Measures and Models section, which conceptualizes PDs from a dimensional perspective (APA, 2013, p. 761). Dimensional conceptualizations have posited that PDs can be understood as configurations of maladaptive or extreme variants of normal range traits (Krueger, Derringer, Markon, Watson, & Skodol, 2012; Lynam & Miller, 2019).

Defining psychopathy. Traditional conceptualizations of psychopathy posited it as a syndrome or unitary construct (a disorder defined by a cluster of related symptoms), and many contemporary researchers often use global scores to diagnose and assess psychopathy (Lilienfeld, 2013). However, many of the traits that have been identified as central to psychopathy do not represent a syndrome and instead load onto weakly or moderately correlated higher order domains, suggesting that 'psychopathy' ought to be conceptualized as a compound variable or multifaceted disorder rather than a unitary entity (Benning, Patrick, Blonigen, Hickes, & Iacono 2005; Hare, 1996; Patrick, 2018a). As a result, contemporary conceptualizations often posit distinct clusters of symptoms (e.g., factors or facets) to describe psychopathy, with some variation in traits identified as prototypical and varying cluster structures (e.g., two, three, four factor models) (Hare et al., 2018; Sellbom, Lilienfeld, Fowler, McCrary, 2018; Patrick, Fowles, & Krueger, 2009). The term 'psychopathy' is thus somewhat misleading, as it does not refer to a singular pathology, but rather a complex personality configuration with potentially heterogeneous presentations (Hicks & Drislane, 2018). Additionally, as support for dimensional models has grown, psychopathy has been conceptualized as continuous rather than categorical (i.e., varying by degree across the general population rather than isolated to a particular subset) (Edens, Marcus, Lilienfeld, & Poythress, 2006). Thus, it is more appropriate to describe psychopathy in terms of high or low trait manifestations and to specify which domains or traits are elevated rather than using cut thresholds (e.g., psychopathic or not) and total scores (Patrick, 2018a).

Defining psychopathy thus presents several challenges because of the multifaceted and dimensional nature of the disorder, potential heterogeneity, and ongoing debate over the scope and precise delineation of the construct (Blackburn, 1988; Patrick et al., 2009; Skeem et al.,

2011). However, in general psychopathy can be defined as a severe personality disorder that encompasses a constellation of traits and involves significant interpersonal and social impairment (Cleckley, 1950; Hare. 1996; Lykken, 1995; Patrick, 2018b, Raine et al., 2006). While there has been contention over which traits are central to the disorder, the following section provides an overview of traits relating to thinking, feeling, and behaving that have been identified as prototypical of psychopathy by various dominant perspectives.

Thinking. Personality impairments relating to thinking generally refer to psychoticism, which has been defined as unusual beliefs and experience (e.g., delusions, hallucinations), cognitive and perceptual dysregulation (e.g., depersonalization, dissociation), and eccentricity (e.g., bizarre behavior or speech) (APA, 2013, p. 781). Psychopathy has famously been defined by an absence of psychotic symptoms. In Hervey Cleckley's *The Mask of Sanity*, a seminal work in the field, the most notable feature of psychopathy, and arguably its most intriguing, was the absence of obvious signs of mental impairments or distress. Psychopathic individuals were typified by good intelligence, charm, and seeming normality upon first impression (Cleckley, 1950). Indeed, the comparison between schizophrenic patients and psychopathic individuals was what lead Cleckley to observe, "[t]he first and most striking difference is this. One is confronted with a convincing mask of sanity…not merely an ordinary two-dimensional mask but what seems to be a solid and substantial structural image of the sane and rational personality" (Cleckley, 1950, p. 397). Cleckley even listed "absence of delusions or other signs of irrational thinking" as one of his criteria for psychopathy (Cleckley, 1950). While generally no longer an exclusionary criterion, contemporary perspectives have mostly not included traits relating to psychoticism, and in general, lucidity is still considered a hallmark of psychopathy (Skeem et al., 2011).

Feeling. Deficits in empathy and other forms of affective processing have long been identified as a core feature of psychopathy, with references to callousness, cold-heartedness, lack of remorse, ruthless, detachment, shallow emotionality, incapacity for love, and lack of conscience appearing in all dominant conceptualizations (Hare, 1996; Karpman, 1948; McCord & McCord, 1964; Patrick et al., 2009). Empathy has been defined as the ability to understand, recognize, and share the feelings of others and has been conceptualized along two broad domains, cognitive empathy (ability to identify or understand what someone else is feeling or thinking) and affective empathy (feeling or emotionally responding to what someone else is experiencing) (Vitacco, Lishner, Gray, & Trice, 2019). Psychopathy has been linked to impairments in both. Two meta-analyses examining emotion recognition in psychopathy found consistent impairment in identifying negative emotions in others, particularly fearful and sad expressions (Marsh & Blair, 2008; Wilson, Demetrioff, & Porter, 2008). Several studies investigating the relationship between affective empathy and psychopathy found decreased emotional contagion to sad, angry, and fearful faces, and decreased emphatic concern for those in need (Lishner, Hong, Jiang, Vitacco, & Neumann, 2015; Lishner et al., 2012).

Additionally, shallow or superficial affect in general has been identified as core to psychopathy, and particularly a lack of internalizing symptoms (i.e., negative emotionality) has been argued to be a defining feature (Cleckley, 1950; Lykken, 1995; Lynam & Miller, 2015; Patrick et al., 2009; Skeem et al., 2011). Negative emotionality has been defined as persistent experience of negative emotions, including anxiety, fear, worry, and depression, and has often been associated with high levels of impairment and distress (APA, 2013, p. 779). Descriptions of psychopathy have often emphasized lack of distress and the appearance of calm and even superficial affability (Cleckley, 1950, Hare, 1999; Prichard, 1837). For example, Cleckley

included in his diagnostic criteria “lack of nervousness”, “poverty in major affective reaction”, and “suicide rarely carried out”, and McCord and McCord (1964), influential contemporaries of Cleckley, posited that “the psychopath [was] almost the antithesis of neurosis” (Cleckley, 1950; McCord & McCord, 1964, p. 47). Additionally, contemporary perspectives have also included emotional stability features. Most notably, the construct of Fearless Dominance/Boldness (e.g., daringness, audacity, stress immunity, social dominance, and self-assuredness) has been argued to be an essential component and what accounts for the distinctive ‘mask’ aspect of seemingly good mental health (Benning et al., 2005; Lilienfeld, Watts, Smith, & Latzman, 2018; Patrick, 2018b; Patrick, et al., 2009).

Related to lack of empathy, psychopathy has also been characterized by serious impairments in interpersonal functioning (e.g., antagonism). As Robert Hare put it, in his influential book *Without Conscience*, “[p]sychopaths are social predators who charm, manipulate, and ruthlessly plow their way through life, leaving a broad trail of broken hearts, shattered expectations, and empty wallets” (Hare, 1999, p. xi). Antagonism has been defined as behavior that creates interpersonal conflict, including manipulativeness, hostility, deceitfulness, dishonesty, callousness, and grandiosity, all of which have been considered core features of psychopathy (APA, 2013, p. 780; Hare & Neumann, 2008, Lynam & Miller, 2015; Patrick et al., 2009). For example, Cleckley (1950) noted that “[the psychopath] is always distinguished by egocentricity…[and] is to be trusted no more in his accounts of the past than in his promises for the future or his statement of present intentions” (p. 370, p. 362). While often described as superficially charming and affable upon first impression, a study investigating interpersonal perceptions of psychopathic individuals found that psychopathy was generally associated with

lower ratings of likeability and nurturance and was generally seen negatively (Rauthmann, 2012).

Behaving. Behavioral disinhibition has also been identified as a core feature of psychopathy. Disinhibition has been defined as deficits in behavioral constraint, including difficultly delaying immediate gratification, failure to learn from past experience, lack of planfullness, irresponsibility, impulsivity, and recklessness (APA, 2013, p. 780; Krueger, Markon, Patrick, & Iacono, 2005). Descriptions of psychopathy have emphasized deficits in all these domains and have included acting without consideration for consequences, lack of regard for honoring agreements and commitments, making spur of the moment decisions, and engaging in risky behavior without regard for the safety of others or self (Cleckley, 1950; Hare & Neumann, 2008, Lykken, 1995; Widiger, 2012). Cleckley (1950), for example, included "unreliability", "poor judgment and failure to learn from experience", and "failure to follow any life plan" in his clinical profile. Additionally, an important related domain construct, externalizing pathology (e.g., disinhibition, aggression, substance abuse) has often been used to describe and discuss psychopathy (Patrick et al., 2009). While not synonymous, psychopathy often has included and overlapped with most externalizing symptoms. However, unlike psychopathy, externalizing generally has been associated with elevated levels of internalizing symptoms (Krueger, 1999; Patrick, Fowles, & Krueger, 2009).

Psychopathy has garnered much attention because of its association with serious impairments in prosocial functioning and with crime. Beginning with the early clinical literature and continuing to the present, antisocial behavior, aggression, and violence have often characterized psychopathy (Hare, 1996; McCord & McCord, 1964; Pinel, 1806; Prichard, 1827). Antisocial behavior has been defined as failure to conform behaviorally to authority (e.g.,

oppositional, defiant) or societal expectations (e.g., truancy) and violation of the rights of others (e.g., assault, rape, theft) (Frick, 1998). Developmental trajectories for psychopathy often include antisocial behavior and conduct problems beginning in early childhood, and adult diagnostic criteria have often included antisocial behavior (Hare, 1999). Additionally, psychopathy has been associated with heightened aggression and has been considered a major risk factor for violence (Reidy & Holland, 2019). Aggression has been delineated along two broad domains, proactive aggression (e.g., instrumental, intentional, "cold-blooded") and reactive aggression (e.g., impulsive, affect-laden, "hot-headed") (Porter, Woodworth, & Black, 2018). Given the exploitative, detached, and callous interpersonal style associated with psychopathy, proactive aggression has often been considered characteristic of the disorder, although both proactive and reactive aggression exhibit a strong association with psychopathy (Raine et al., 2006). Psychopathy is also associated with criminal versatility and often involves chronic offending and greater frequency and severity of violent offending, in particular (Hare, 2003; Reidy & Holland, 2019). For example, a disproportionate number of sexual homicides are committed by male psychopathic offenders (Porter, Woodworth, Earle, Drugge, & Boer, 2003).

Historical perspectives. The first descriptions of psychopathy appeared in the early 19th century during the advent of the field of psychiatry and the classification of mental disorders, although the term "psychopathy" was not used in its contemporary sense until the 20th century. The following section provides an overview of (a) the origin of the term, (b) early psychiatric perspectives, and (c) influential contributors of the 20th century.

Origins of the term. The term "psychopathy" was first used to describe psychopathology more generally, as the etymology of the word implies, beginning with the German psychiatrist Julius Koch near the end of the 19th century (Blackburn, 1988). Koch (1891) applied the term

"psychopathic inferiority" to a wide array of conditions presumed at the time to arise from underlying innate causes including intellectual disabilities (Kiehl & Hoffman, 2011; Skeem et al., 2011). The term "psychopathic personality" was then adopted to refer more specifically to various maladaptive personalities often associated with antisociality, beginning with Emil Kraepelin (Crocq, 2013). Kraepelin originally classified four types of psychopathic personalities, which included the "pathological liars and swindlers" who were characterized as glib and charming but felt no responsibility toward others and often engaged in fraudulent behavior; the "born criminals" who were cold and manipulative but appeared socially well adjusted; the "criminals by impulse" who in contrast committed crimes out of passion; and the "weak willed" who lacked self-direction (Millon, Simonsen, & Birket-Smith, 1998). Following Kraepelin, Kurt Schneider expanded the category of psychopathic personalities to include ten types that were more broadly representative of personality disorders in general (Blackburn, 1988). Thus, at the beginning of 20th century, the term psychopathy applied to a broad and heterogeneous class of individuals often associated with antisocial behavior and criminality.

Pinel. The French physician, Phillippe Pinel, was first to describe a disorder similar to psychopathy under his term *manie sans délire* or "mania without delirium" (Hare et al., 2018; Partick, 2018b). Pinel (1806) characterized those with the disorder as prone to episodes of anger and violence, but who otherwise seemed strangely sound of mind. Among his case studies of *manie sans délire*, included one of a young man who, despite being successful and seemingly intelligent, would often fight with others to his own detriment. Most paradoxically, despite being charitable to others at times, he was also known for being cruel towards animals and was eventually committed to an asylum for throwing a women down a well because she insulted him (Pinel, 1806, p. 151-152). Pinel (1806) theorized that *manie sans délire* was a form of mental

illness that arose from a "perversion of the active faculties" rather than from "lesions to the understanding". As a result it affected individuals' temper and behavior, but not rational abilities, which he noted, with some surprise, was seemingly unusual given the common assumption that "delirium" would always occur in cases of mental illness (Pinel, 1806, p. 150).

Prichard. Another important early figure was the British physician, James Prichard, and his category of "moral insanity", which was similar to *manie sans délire* (Prichard, 1837). At the time, the concept of "moral" extended beyond the meaning of ethical and also referred to affective experience (Jones, 2017). Prichard's use of the term "moral insanity" was thus meant to convey that the disorder arose from "derangements" of the "affective faculties" that effected the expression of feelings and behavior, but not the "rational faculties" (Prichard, 1837). However, unlike Pinel, Prichard emphasized social deviance in general as central to the disorder, not just violence. He noted that in cases of the disorder, "…the power of self-governance is lost or greatly impaired and the individual is found to be incapable, not of talking or reasoning upon any subject proposed to him, for this he will often do with great shrewdness and volubility, but of conducting himself with decency and propriety in the business of life" (Prichard, 1837, p. 15). Prichard, similar to others, posited that the disorder was defined by the appearance of good intelligence, but marked dysfunction and impairment in everyday living.

Partridge & Henderson. Among the first to conceptualize 'psychopathy' as distinct from the other psychopathic personalities, were the American psychologist George Partridge and Scottish psychiatrist David Henderson (Hervé, 2017; Kiehl & Hoffman, 2011). Partridge (1930) argued that the category of psychopathic personality had become a catchall for "unclassified maladjusted" individuals, but that within the category a distinct group, which he termed "sociopathic" personality, could be found whose antisocial ways stemmed from a distinct

pathology. Similarly, Henderson (1942) agreed that the category had become a "dumping ground" and that the "psychopathic state" was a real "illness and character deviation" that needed to be recognized as a distinct disorder equivalent in severity to schizophrenia or mania (p. 148). Both Partridge and Henderson characterized persistent antisocial behavior as a key feature of psychopathy and depicted psychopathic individuals as egocentric, lacking inhibition, impulsive, exploitative, feckless, and unable to learn from experience (Harvé, 2017; Henderson, 1942).

Cleckley. Perhaps the most influential contributor of the 20th century to the conceptualization of psychopathy was the American psychiatrist, Harvey Cleckley, in his seminal work *The Mask of Sanity* (Hare et al., 2018; Patrick, Fowles, Krueger, 2009). Cleckley (1950) described psychopathy as a paradoxical condition wherein deviance, irresponsibility, and antisociality were 'masked' by an outward appearance of good mental health, superficial charm, and seeming intelligence. From his extensive work with psychiatric patients, Cleckley (1950) proposed sixteen diagnostic criteria that typified psychopathy, (1) "superficial charm and good intelligence", (2) "absence of delusions and other signs of irrational thinking", (3) "absence of nervousness or psychoneurotic manifestations", (4) "unreliability", (5) "untruthfulness and insincerity", (6) "lack of remorse or shame", (7) "inadequately motivated antisocial behavior", (8) "poor judgment and failure to learn by experience", (9) "pathological egocentricity and incapacity for love", (10) "general poverty in major affective reactions", (11) "specific loss of insight", (12) "unresponsiveness in general interpersonal relations", (13) "fantastic and uninviting behavior, with drink and sometimes without", (14) "suicide rarely carried out", (15) "sex life impersonal, trivial, and poorly integrated", and (16) "failure to follow any life plan". While psychopathic individuals were characterized as prolific in their antisocial ways (e.g.,

stealing, forging bad checks, assault), they were not defined as particularly malicious, but rather highly erratic (i.e., mostly driven by whim rather than strong emotions or intention) and seemingly unaware of the feelings of others (Cleckley, 1950).

McCord & McCord. McCord and McCord's influential work on criminal psychopathy captured a more pernicious side of the disorder than Cleckley's more erratic and less violent type (Hicks & Drislane, 2018). McCord and McCord (1964) characterized psychopathic individuals as inherently cold hearted, detached from others, profoundly "loveless" and "guiltless", and prone to episodes of violence and aggression. "The total pattern of the psychopath's personality differentiates him from the normal criminal. His aggression is more intense, his impulsivity more pronounced, his emotional reactions more shallow. His guiltlessness, however, is the critical distinguishing trait. The normal criminal has an internalized, albeit warped, set of values. If he violates these standards he feels guilt" (McCord & McCord, 1964, p. 51). McCord and McCord (1964) posited that criminal and violent behavior was common among psychopathic individuals, but considered it a consequence of their emotionless and detached nature, rather than a sole indicator of the disorder.

Karpman. "The true idiopathic psychopath is incapable of being frustrated in love for he does not love anyone but himself…this is the type of individual for whom conscience has never developed" (Karpman, 1948, p. 458). Benjamin Karpman was the first to introduce the notion of primary and secondary psychopathy, which arose from his observation that psychopathic behavior could arise from different etiological influences (Hicks & Drislane, 2018; Karpman, 1948). Karpman (1948) proposed that primary, or "idiopathic", as he termed it, and secondary psychopathy were both characterized by reckless behavior, stealing, lying, and lack of conscience. However, primary psychopathy arose from an innate emotional deficit that prevented

the development of conscience and so the ability to empathize and interact pro-socially with others and feel guilt or remorse, whereas secondary psychopathy arose as a reaction to aversive experiences, including parental rejection or abuse. Secondary psychopathy, thus could be overcome through therapy, but primary psychopathy could not be treated, according to Karpman (Karpman, 1948). Because of this important difference, Karpman (1948) argued that greater care needed to be taken in distinguishing primary from secondary psychopathy.

Lykken. David Lykken (1995) also proposed a distinction between primary and secondary psychopathy because of his concern that psychopathy not be conflated with antisociality more generally. Lykken (1995) argued that those who committed crimes or displayed a pattern of antisocial behavior should not be automatically labeled as psychopathic because such behavior could arise from a variety of factors, not only personal pathology. Lykken (1995) argued that psychopathy should be reserved for the antisocial behavior that arose from psychological or biological etiologies and that sociopathy should be applied to antisocial individuals who became that way through social influences, such as delinquent peers groups and absence parenting. Within the category of psychopathy, variants could be further identified that displayed different causes of their antisocial behavior. The primary variant reflected Cleckley's conceptualization and was defined by shallow affect, specifically fearlessness. The secondary variant, in contrast, was defined by normal range affect, but was impulsive and hot headed. Thus, primary psychopathy could be distinguished from other antisocial personalities because of affective deficits.

Summary. The first accounts of psychopathy appeared in the early psychiatric literature of the 19th century and emphasized both antisociality and the appearance of normal mental functioning (e.g. intact "rational faculties") (Pinel, 1806; Prichard, 1837). The term psychopathy

was first applied to a large and heterogeneous group historically, with the notion of psychopathy as a district disorder emerging during the 20th century (Blackburn, 1988; Henderson, 1942; Koch, 1891). While many of the early 20th century contributors argued that "psychopathy" applied to a unique and unitary disorder, variations in conceptualizations continued with differing trait manifestations posited that sparked a great deal of debate (e.g., Cleckley's (1950) feckless and disinhibited variety vs. McCord and McCord's (1964) more antisocial and violent variant). Because of the dominance of categorical perspectives that posited that mental disorders were defined by a homogenous group presentation, the differing conceptualizations and heterogeneity that persist in the class (e.g. primary and secondary variations) raised many questions for some researchers regarding the validity of the psychopathy construct (Blackburn, 1988). While most agreed that psychopathy was characterized by affective and interpersonal impairments accompanied by antisociality, much disagreement persisted over the definition and scope of the psychopathy construct during mid and late the 20th century (Blackburn, 1988; Lykken, 1995; Patrick, 2009).

Contemporary perspectives. Historical descriptions of psychopathy greatly influenced contemporary conceptualizations and operationalizations of the disorder (Cooke & Logan, 2018; Hare, Neumann, Mokros, 2018; Lilienfeld, 1990; Patrick et al., 2009). Initially, much of the research on psychopathy was conducted in incarcerated samples, and the psychopathy measures that were developed consisted largely of clinician rating scales and then later self-report scales (Harvé, 2017). While historical conceptualizations posited psychopathy as a unitary disorder, contemporary perspectives posited psychopathy as a multifaceted (i.e., consisting of distinct trait clusters) and dimensional (i.e., varying by degree across the general population) (Edens et al., 2006; Hare. 1996; Patrick, 2018a). However, despite some agreement, there continued to be

much debate between contemporary perspectives over how best to conceptualize and operationalize psychopathy (Cooke & Logan, 2018; Lilienfeld & Andrews, 1996; Miller & Lynam, 2012). The following section provides (a) an overview of dominant contemporary models and measures of psychopathy and (b) brief discussion of some of the prominent contemporary controversies surrounding the conceptualization of the disorder.

PCL-R. The dominant measure for clinical and forensic assessment has been the Psychopathy Checklist−Revised (PCL-R) (Hare et al., 2018). The PCL was originally developed in the early 1980s by the Canadian psychologist, Robert Hare, to provide a reliable and valid measure for assessing psychopathy in incarcerated samples (Hare, 1986; Hare & Neumann, 2008). The PCL-R contains twenty items. Several factor structures underlying these items have been proposed, with the original two-factor and current four-factor structure being the most established (Neumann, Hare, & Newman, 2007). The original factor solution included Factor 1, encompassing the interpersonal and affective components of psychopathy, and Factor 2, encompassing the disinhibited lifestyle and antisocial behavior components (Hare et al., 2018). Most studies have consistently found a moderate association between the two (r = .50) (Hare & Neumann, 2008). The current four factor solution subdivides the original two factors and includes the Interpersonal, Affective, Lifestyle, and Antisocial facets (Hare et al., 2018). Additionally, the PCL-R factors have shown differing associations with external criterion measures. For example, narcissism and social dominance have been positively associated with Factor 1, and substance abuse, aggression, and recidivism have been positively associated with Factor 2 (Hare et al., 2018). (See Table 1 for item descriptions and factor/facet structure).

PPI. Lilienfeld (1990) developed the Psychopathic Personality Inventory (PPI) to provide a self-report alternative for assessing psychopathy in noncriminal and subclinical samples.

Psychopathy was conceptualized as multifaceted and as a result eight distinct subscales were developed to assess various aspects of the construct (see Table 2) (Lilienfeld & Andrews, 1996). Later factor analysis revealed two higher order factors, PPI-I, termed "Fearless Dominance" and

Table 1

Psychopathy Checklist—Revised (PCL-R) Factors, Facets, and Items

Factor 1		Factor 2	
Interpersonal	Affective	Lifestyle	Antisocial
Glibness/superficial charm	Lack of remorse or guilt	Need for stimulation/proneness to boredom	Poor behavioral control
Grandiose sense of self-worth	Shallow affect	Parasitic lifestyle	Early behavioral problems
Pathological lying	Callousness/lack of empathy	Lack of realistic long-term goals	Juvenile delinquency
Conning/manipulative	Failure to accept responsibility for own actions	Impulsivity	Revocation of conditional release
		Irresponsibility	Criminal versatility

(Hare, 2003)

Note. Two items, "Promiscuous sexual behavior" and "Many short term marital relationships", were not included in the factor structure.

PPI-II, originally termed "Impulsive Antisociality" and eventually renamed "Self-Centered Impulsivity" (Benning, Patrick, Hicks, Blonigen, and Krueger, 2003, Lilienfeld & Windows, 2005). Only seven of the subscales loaded into either FD or SCI, and the eighth, Coldheartedness, did not load appreciable into either factor (Benning et al., 2003). Importantly, Fearless Dominance and Self-Centered Impulsivity appeared to be largely unrelated. In Benning et al. (2003)'s original analysis, the two factors were orthogonal ($r = -.07$) and, in a later meta-analysis of forty-nine publications, Miller and Lynam (2012) found that they were only correlated by $r = .05$. The PPI factors have also shown differing associations with criterion measures. Fearless Dominance has shown a positive association with narcissism and thrill seeking and a negative association with internalizing symptoms, including depression and

anxiety (Benning et al., 2003; Miller & Lynam, 2012). In contrast, Self-Centered Impulsivity has shown a positive association with some internalizing symptoms and aggression and hostility (Benning et al., 2003; Benning et al., 2005). The differing associations and orthogonal nature of the PPI factors has provided support for the conceptualization of psychopathy as a compound variable or multifaceted disorder.

Table 2

Psychopathic Personality Inventory (PPI) Factors and Subscales

PPI-I Fearless Dominance	PPI-II Self-Centered Impulsivity	Coldheartedness
Social influence	Machiavellian egocentricity	Coldheartedness
Fearlessness	Rebellious nonconformity	
Stress immunity	Blame externalization	
	Carefree nonplanfullness	

(Benning et al., 2003; Lilienfeld & Andrews, 1996)

Triarchic Model. The triarchic model was developed to provide a conceptual framework to integrate and reconcile previous conceptualizations and operationalizations of psychopathy (Patrick, Fowles, & Krueger, 2009). Specifically, the model posits that the similarities and difference between various theories and measures of psychopathy are explained by differing emphasis placed on three phenotypic domains: meanness, boldness, and disinhibition (Patrick, Fowles, & Krueger, 2009). Meanness encompasses a variety of traits including lack of empathy, detachment from others, rebelliousness, and exploitativeness. Boldness closely aligns with PPI Fearless Dominance and taps into traits including stress immunity, ability to remain calm under pressure, social efficacy, and thrill seeking. While boldness could ostensibly be considered an adaptive trait, in combination with other psychopathic traits it could contribute to more maladaptive aspects of thrill seeking and narcissism (Lilienfeld et al., 2018; Patrick et al., 2009;

Patrick, 2018). Lastly, disinhibition encompasses impulsivity, lack of forethought, poor behavioral control, and deficits in emotional regulation. Through the triachic model perspective, differences in historical and contemporary conceptualizations of psychopathy can be understood as arising from differences in how each domain is emphasized (Patrick, Fowles, & Krueger, 2009; Skeem et al., 2011). For example, Cleckley's depiction of psychopathy can be understood as tapping into a bolder and more disinhibited variant compared to McCord and McCord's equally disinhibited but more mean variety. The triachic model has highlighted the complexity of the psychopathy construct as encompassing multiple domains that not only intersect, but potentially interact (Skeem et al., 2011).

Fearless Dominance/Boldness. One of the most prominent and ongoing contemporary debates has involved the relevance of Fearless Dominance/Boldness within the psychopathy construct (Lilienfeld et al., 2012; Miller & Lynam, 2012). Some researchers have argued that as psychopathy involves maladaptive functioning, including Fearless Dominance/Boldness, which arguably represents adaptive functioning (e.g, stress immunity and emotional stability features) is inappropriate (Garofolo & Neumann, 2019; Miller & Lynam, 2012). However, others have argued that Fearless Dominance/Boldness traits account for the 'mask' aspect of psychopathy that has appeared in many accounts of the disorder and that while Fearless Dominance/Boldness alone may represent adaptive features, in conjunction with other psychopathic traits it represents a more maladaptive form of extroversion and so is relevant and arguably a defining feature of the disorder (Benning, Venables, & Hall, 2018; Lilienfeld et al., 2012; Lilienfeld, et al., 2018; Patrick, 2018b; Patrick et al., 2009). To what extent contemporary models and measures of psychopathy include Fearless Dominance/Boldness features varies and the relevance of Fearless Dominance/Boldness remains an open question and topic of debate.

FFM conceptualization. Differences between historical and contemporary perspectives can also be understood and reconciled from a general personality perspectives (Lynam et al., 2018). Psychopathy, as a personality disorder, can be understood as consisting of a maladaptive configuration of various personality traits, and differing conceptualizations can be understood as encompassing differing but potentially overlapping trait configurations (Lynam et al., 2018; Widiger et al., 2012). The Five Factor Model (FFM) has been a prominent model of personality and assesses five basic trait domains, which include Neuroticism (N), Extraversion (E), Openness to experience (O), Agreeableness (A), and Conscientiousness (C) (Costa & McCrae, 1992). Neuroticism encompasses traits including anxiety, hostility, impulsivity, and vulnerability. Extraversion encompasses traits including assertiveness, gregariousness, and warmth. Openness to experience includes fantasy, ideas, and aesthetics. Agreeableness includes straightforwardness, compliance, and altruism. Conscientiousness includes dutifulness, deliberation, and self-discipline. Each domain can be understood as a continuum that all individuals fall somewhere along. Psychopathy can thus be understood as a particular personality configuration encompassing maladaptive or extreme variants of normal range traits from the FFM (Lynam & Miller, 2015). Development of a measure to assess psychopathy (i.e., the Elemental Psychopathy Assessment) from a general personality perspective began by first translating the PCL-R items into FFM language (Widiger & Lynam, 1998). A profile was then developed, which included low N (with the exception of hostility and impulsivity), high E (with the exception of warmth), low A and low C; O was unrelated (Lynam & Miller, 2019; Widiger & Lynam, 1998). From the basic profile, eighteen traits were developed, reflecting more maladaptive variants of the FFM traits that were identified as reflective of psychopathy (Lynam & Miller, 2015). The eighteen traits loaded onto four factors, Antagonism, Emotional Stability,

Narcissism, and Disinhibition, which can be understood as reflecting four broad domains underpinning psychopathy (see Table 3) (Lynam et al., 2018).

Table 3

Elemental Psychopathy Assessment (EPA) Factors and Subscales

Antagonism	Emotional Stability	Narcissism	Disinhibition
Coldness	Unconcern	Anger	Thrill Seeking
Distrust	Self-contentment	Self-assured	Urgency
Manipulation	Invulnerable	Dominance	Opposition
Self-centered		Arrogance	Disobliged
Callous			Impersistence
			Rashness

(Lyman & Miller, 2014).

CAPP. The Compressive Assessment of Psychopathic Personality (CAPP) was developed to provide both a comprehensive conceptual map of the construct and a more dynamic measure that could assess changes in psychopathic traits over time (Cooke & Logan, 2018). Development began using a lexical approach in which constructs associated with psychopathy were broadly sampled using natural language to describe these traits (Kreis, Cooke, Michie, Hoff, & Logan, 2012). Prototypical analysis was then used to refine the items using both clinician and researcher ratings and then items were grouped into broader symptom types using trait descriptive adjectives (Cooke, Hart, Logan, & Michie, 2012). Thirty three symptoms were identified (e.g., self-centeredness, lack of anxiety, antagonism, detachment, lack of perseverance, and suspiciousness). The thirty three symptoms were then mapped onto six broader domains (i.e., Attachment, Behavioral, Cognitive, Dominance, Emotional, and Self) (see Table 4) (Cook et al., 2012; Kries et al., 2012). The CAPP model thus provides a comprehensive concept map of psychopathic traits using natural language making it accessible and complex enough to capture

nuances within symptom dimensions (Cook & Logan, 2018). Additionally, because the CAPP items have focused on personality traits instead of behavioral indicators, the CAPP is more applicable for assessing psychopathy across different settings and contexts, including both forensic and general samples (Cooke & Logan, 2018).

Table 4

Comprehensive Assessment of Psychopathic Personality (CAPP) Domains and Symptoms

Attachment	Behavioral	Cognitive	Dominance	Emotional	Self
Detached	Lacks Perseverance	Suspicious	Antagonistic	Lacks Anxiety	Self-Centered
Uncommitted	Unreliable	Lacks Concentration	Domineering	Lacks Pleasure	Self-Aggrandizing
Unempathic	Reckless	Intolerant	Deceitful	Lacks Emotional Depth	Sense of Uniqueness
Uncaring	Restless	Inflexible	Manipulative	Lacks Emotional Stability	Sense of Entitlement
	Disruptive	Lacks Planfulness	Insincere	Lacks Remorse	Sense of Invulnerability
	Aggressive		Garrulous		Self-Justifying
					Unstable Self-Concept

(Cook et al., 2012).

ASPD. The Diagnostic and Statistical Manual of Mental Disorders (DSM) has not formally included a 'psychopathy' diagnosis, but has instead included Antisocial Personality Disorder (ASPD), which has been posited as synonymous with psychopathy (APA, 2013, p. 659). However, this has been much debated with some regarding psychopathy and ASPD as separable constructs that share an asymmetric relationship (Hare, 2003; Skeem et al., 2011; Skeem, Poythress, Edens, Lilienfeld, & Cale, 2003). The origin of ASPD traces back to Partridge's conceptualization of psychopathy and later work by the influential sociologist Lee Robins, who was greatly influenced by Cleckley (Blackburn, 1988). Robins (1972) proposed a

nineteen criteria diagnosis of "sociopathy", which she intended to be similar to Cleckley's conception of psychopathy. However, Robins' criteria, while including similar features such as lack of guilt, omitted egocentricity, shallow affect, and inability to learn from experience (Widiger & Crego, 2018). Additionally, her criteria included items relating to general dysfunction, including suicidality, which notable contrasted with Cleckley's "suicide rarely carried out" (Cleckley, 1941/1970). Robins' criteria formed the basis for the first iteration of ASPD in the DSM-III, and as a result ASPD emphasized externalizing symptoms and specific behaviors over a more Clecklyan conceptualization and personality traits (Widiger & Crego, 2018).

The current diagnosis in the DSM-5 has remained similar and emphasizes a pattern of early chronic antisocial behavior as the core feature of the disorder (see Table 5) (APA, 2013. P. 659). Additionally, while ASPD does include other personality traits as symptoms (e.g., lack of remorse, deceitfulness), only three of seven listed symptoms are necessary to receive a diagnosis, leading to a large heterogeneous category (e.g., 50% of offenders are estimated to meet criteria) (Hare, 2003; Lykken, 1995; Widiger & Crego, 2018). While the full ASPD criteria overlap with many psychopathy conceptualizations, some researchers continue to argue that the diagnosis should not be considered equivalent given the high degree of heterogeneity and potentially exclusive emphasis on externalizing symptoms (Patrick, Bradley, & Lang, 1993; Skeem et al., 2011).

Summary. Contemporary researchers have largely conceptualized psychopathy as a multifaceted personality disorder characterized by a variety of traits including shallow affect, detachment from others, social dominance, hostility, aggression, impulsivity, irresponsibility, and lack of empathy. There have been a variety of different perspectives and approaches that

have sought to create comprehensive conceptualizations and assessment measures of psychopathy. These models and measures have revealed that the trait domains of psychopathy represent largely independent dimensions, with differing external criterion associations.

Table 5

Antisocial Personality Disorder Diagnostic Criteria

Criteria
A. A pervasive pattern of disregard for and violation of the rights of others, occurring since age 15 years, as indicated by three (or more) of the following: 1. Failure to conform to social norms with respect for lawful behaviors, as indicated by repeatedly performing acts that are grounds for arrest. 2. Deceitfulness, as indicated by repeated lying, use of aliases, or conning others for personal profit or pleasure. 3. Impulsivity or failure to plan ahead. 4. Irritability and aggressiveness, as indicated by repeated physical fights or assaults. 5. Reckless disregard for safety of self or others. 6. Consistent irresponsibility, as indicated by repeated failure to sustain consistent work behavior or honor financial obligations. 7. Lack of remorse, as indicated by being indifferent to or rationalizing having hurt, mistreated, or stolen from another.
B. The individual is at least age 18 years.
C. There is evidence of conduct disorder with onset before age 15 years.
D. The occurrence of antisocial behavior is not exclusively during the course of schizophrenia or bipolar disorder.

(APA, 2013, p. 659).

Psychopathy is thus better conceptualized as a configuration of potentially uncorrelated trait dimensions rather than a classical unitary syndrome. Different perspectives have posited different numbers of trait dimensions or facets with the most dominant being the PCL-R two and four factor solutions (Affective/Interpersonal and Lifestyle/Antisocial Behavior) and PPI/Triarchic model three domains (boldness, disinhibition, and meanness). However, there has continued to be debate and questions regarding the appropriate scope of the construct and which trait configuration or configurations ought to be considered psychopathy.

Conclusion. With diverse conceptualizations and differing trait configurations from three (PPI, triarchic model), four (EPA, PCL-R), or even six (CAPP) psychopathy domains yielding multiple and differing manifestations of 'psychopathy', the question of 'so what even is psychopathy' logically arises. The concern over how best to define psychopathy and the question of differing manifestations or subtypes has been a source of debate since the early 20th century and has yet to be resolved. Questions regarding whether certain domains are more central to the construct than others and which or how many domains need to be elevated to be considered 'psychopathy' remain at the center of many contemporary controversies. Some have argued that meanness and antagonism are the essential features, while other have maintained that boldness in the presence of meanness and disinhibition is the defining characteristic (Crego & Widiger, 2014; Lilienfield et al., 2012; Lynam et al. 2018; Patrick, 2018b). While the role of boldness remains a contested topic, some have argued that the boldness domain, which aligns with many of the features of psychopathy described by Cleckley, differentiates psychopathy from ASPD and accounts for the distinction between primary and secondary variants of psychopathy made by some theorists (Hicks & Drislane 2018; Karpman, 1948; Lykken, 1995; Skeem et al., 2011). The question of what is psychopathy can be answered by acknowledging that, despite the singularity of the word, 'psychopathy' does not represent one trait configuration, but possibly multiple overlapping configurations that vary depending on which trait domains are elevated.

What is the etiology of psychopathy?

The question of what makes the 'psychopath', so to speak, has long puzzled and greatly interested researchers because of the 'masked' nature of the disorder. The appearance of psychological normality, adequate intelligence, and social poise displayed by psychopathic individuals seemed fundamentally incongruent with their reckless, unrestrained, irresponsible,

and often self-defeating behavior (Cleckley, 1950; Hare, 1993; Prichard, 1837). The cause of psychopathy thus seemed somewhat of a conundrum and prompted many to posit that psychopathy must arise from some sort of severe and unique innate deficit that prevented normal social development (Cleckley, 1950; Henderson, 1942; Karpman, 1948; Lykken, 1995; Partridge, 1930; Pinel, 1806). What the nature of this deficit may be has been a matter of debate, and the etiology of psychopathy remains a hotly contested topic, with some having posited emotional processing deficits and others having posited cognitive processing deficits as the core etiology (Cleckley, 1959; Hamilton & Newman, 2018; Lykken, 1995; Newman, Curtin, Bertsch, & Baskin-Sommers, 2010; Patrick, 2001). However, given the variation and nuance of the construct, the etiological underpinnings of psychopathy are likely to be complex and potentially heterogeneous, leaving many questions regarding the precise nature of the etiological mechanisms and deficits underlying psychopathic traits to be answered (Fowles, 2018; Patrick, 2018a; Patrick et al., 2009).

One etiological pathway that has long been posited as an important mechanism in the development of psychopathy has been deficits in normal fear reactivity (Blair, 2008; Hare, 1965; Lykken, 1995; Patrick, 2001; Patrick et al., 1994). Lykken (1957, 1995) famously proposed the low-fear hypothesis of psychopathy and posited that serious deficits in fear prevented normal prosocial development and accounted for the development of all psychopathic traits, as identified by Cleckley (1950). Given the multifaceted nature of the disorder, contemporary scholars who posit low fear theories of psychopathy argue that fearlessness may underpin some dimensions or traits of psychopathy, but not all (Blair, 2008; Fowles, 2018, Fowles & Dindo, 2009; Patrick, 2018a; Patrick et al., 2009). Depending on the conceptual perspective taken on psychopathy, some have proposed that fearlessness may be etiologically relevant to the affective/interpersonal

component, while others have proposed fearlessness may be mostly relevant to boldness (Fowles & Dindo, 2009; Patrick, 2018a). However, depending on the conceptualization of fear, fearlessness could theoretically increase risk taking and thus contribute to the antisocial/disinhibition component as well (Lykken, 1995). Still others maintain that fearlessness is irrelevant and that psychopathy is better explained by cognitive processing deficits rather than emotional processing deficits (Hamilton & Newman, 2018; Newman et al., 2010). Given the contention surrounding the role of fearlessness in psychopathy and recent developments in the conceptualization of fear, it is worth reinvestigating the low-fear hypothesis in order to shed new light and to attempt to clarify how and if fearlessness is associated with psychopathy.

What is fear?

Before examining the theoretical and empirical links between psychopathy and fearlessness, it is important to discuss the conceptualization of fear and the fundamental role it plays in behavior in order to better understand why it has been posited as an etiological factor in psychopathy. Similar to psychopathy, there has been much debate over how best to define fear, with the most dominant question being how to differentiate fear from anxiety and the most recent being whether fear responses involve both unconscious and conscious components (LeDoux, 2014; Sylver et al., 2011). While an extensive discussion of the topic of fear is beyond the scope of this review, the following section provides an overview of key topics that are relevant to the psychopathy debate, beginning with (a) definitions of fear, (b) prominent measures of fear, (c) fear conditioning, and (d) the neurobiological underpinnings of fear.

Defining fear. Fear has long been conceptualized as a basic emotion vital for facilitating escape behavior (fight/flight/freeze) in response to threat (Lang, Davis, & Öhman, 2000; Sylvers, Lilienfeld, & LaPrairie, 2011). Fear has been described as an intense negative feeling

accompanied by the desire to defend oneself and get out of the situation that elicited the response (Öhman, 2008). Contemporary conceptualizations define fear as (a) distinct from anxiety, (b) encompassing both unconscious and conscious components (e.g., defensive reactivity vs. affective experience), and (c) a personality dimension (trait fearfulness/fearlessness).

Fear and anxiety. Emotion has been conceptualized along two basic dimensions; arousal, denoting intensity, and valence, denoting a bipolar continuum from negative to positive (Lang, Greenwald, Bradley, & Hamm, 1993; Russell, 1980). Both fear and anxiety can be described as high arousal and negative valence but are delineated based on temporal focus, defensive direction, and duration. Fear has been defined as a response to real or perceived imminent threat that elicits withdrawal/escape behavior (fight/flight/freeze), and decreases once the threat is avoided (APA, 2013, p. 189; Öhman & Mineka, 2001; Sylvers, Lilienfeld, & LaPrairie, 2011). Anxiety has been defined as an anticipatory response to future or potential threat that deters approach behavior (hypervigilance/apprehension), and can be sustained (Grillon, 2008; Öhman, 2008; Sylvers, Lilienfeld, & LaPrairie, 2011). Both have been described as intense negative feelings and involve autonomic and somatic manifestation (e.g., changes in heart rate, skin conductance, and respiration etc.) (Öhman, 2008). While there has been confusion and conflation between fear and anxiety, empirical support for the delineation between the two has come from the neuroscience literature, which has provided evidence that different neural networks underpin both and that pharmacological interventions may have differing effects on fear and anxiety responses (Blanchard, Yudko, Rodgers, & Blanchard, 1993; Davis & Whalen, 2001; Grillon, 2008; Lewis, Critchley, Rotshtein, & Dolan, 2006; Sylvers et al., 2011; Tovote, Fadok, & Lüthi, 2015).

Defensive reactivity. Early neurobiological theories of emotion posited two basic neural systems that facilitated behavioral mobilization: the appetitive system, which facilitates approach, and the defensive system, which facilitates withdrawal (Gray, 1987; Lang, 1995; Lang, Davis, & Öhman, 2000). Emotions were conceptualized as 'motive states' that mediated approach and withdrawal behavior (Brown & Farber, 1951). Fear was posited as a basic motive state that mediated withdrawal from immediate threat and was thus vital for mobilizing the organism to escape danger and harm (Öhman & Mineka, 2001). While fear was defined by the fight/flight/freeze responses, which included autonomic and hormonal changes, it was presumed that the 'feeling' of fear was central to defensive reactivity (LeDoux, 2013). However, as the field continued to develop, evidence continued to grow that the physiological and behavioral responses were largely automatic and could be elicited without necessarily being consciously recognized (Öhman, 2008). For example, patients with cortex-based blindness showed autonomic responses to visual threat cues without experiencing fear, suggesting that 'fear' responses and the conscious experience of fear could be separated (LeDoux, 2014). Contemporary perspectives define 'defensive reactivity', also termed threat reactivity, as the automatic physiological and behavioral response to threat (e.g., jumping at a sudden loud sound), and the emotion of fear as the affective state experienced consciously (Hoppenbrouwers et al., 2016; LeDoux, 2013; LeDoux 2014; Öhman, 2008). While, the term 'fear' is still often used to refer to both physiological, behavioral, and emotional responses, a distinction between defensive reactivity and fear, the emotion, should be explicitly made to avoid further confusion and conflation (LeDoux, 2014).

Trait fear. A distinction between state and trait emotions has often been made in order to discuss individual differences in emotional responding. State emotions have been defined as the

affective or reactive states elicited during a specific situation and trait emotions, as the pattern of affective responding exhibited by an individual across time and situations (Sylvers et al., 2010). The fight/flight/freeze response and the feeling of fear can both be understood as state descriptions of fear, and the propensity to experience either can be defined as trait fear (McNaughton, 2011). From a personality perspective, trait fear has been conceptualized along a bipolar dimension of high trait fear (fearfulness) and low trait fear (fearlessness) (Kramer, Patrick, Krueger, & Gasperi, 2012; Vaidyanathan, Patrick, & Bernat, 2009). Fearfulness has been defined as increased levels of state fear in response to unfamiliar or threatening stimuli or situations and a propensity to prefer safety over risky or dangerous situations, a construct which has been termed "harm avoidance" (Vaidyanathan et al., 2009; Tellegen & Waller, 2008). Fearlessness has been defined as an absence or decreased level of state fear toward threat and increased propensity for risk taking and sensation seeking (Kramer et al., 2012; Lykken, 1995). Differences in trait fear can thus be conceptualized as individual variations in defensive reactivity or emotional experience (Kramer et al., 2012; Vaiduanathan et al., 2009).

Assessment of fear. The following section provides an overview of the most extensively utilized ways of assessing fear, beginning with experimental measures and then self-report assessment.

Autonomic arousal. Electrodermal and cardiovascular measures have been extensively used in experimental procedures to index defensive reactivity (Hare, 1965; Hare & Quinn, 1974; Levenston, Patrick et al., 1993; Lykken, 1995). However, electrodermal activity, often indexed by skin conductance, has been found to increase during presentation of both aversive and pleasant stimuli, suggesting that it may better index arousal rather than negative valence specifically (Vaidyanathan et al., 2008). Changes in heart rate have been unreliable at indexing

defensive reactivity, as both acceleration and deceleration responses to aversive stimuli have been found, and may better correlate with task demand rather than stimulus type (Lang, Bradley, & Cuthbert, 1990; Patrick et al., 1993). Thus, while both are often used, electrodermal and cardiovascular measures should be considered unreliable measures of defensive reactivity.

Potentiated startle. A well-established experimental measure of defensive reactivity has been potentiation of the startle reflex response (Bouton, 2007; Kramer et al., 2012; Patrick et al., 1993; Vaidyanathan et al., 2009). Across species, startle is elicited during a sudden presentation of a stimulus and can be enhanced (i.e., potentiated) if the stimulus is presented during exposure to aversive or threat relevant stimuli and reduced if presented during exposure to pleasant stimuli (Kramer et al., 2012; Patrick et al., 1993; Sylvers et al., 2011). Specifically, a noise probe (abrupt sound) has often been used in experimental procedures to induce startle, and the eye blink reflex has been used to index the startle response (Bouton, 2007). Differences in defensive reactivity can thus be assessed by measuring differences in startle response magnitude during presentations of aversive and pleasant stimuli (Vaidyanathan et al., 2009). Additionally, the reflex response occurs within less than 50 ms of the probe presentation, adding support for the validity of the measure as an index of the automatic and largely unconscious 'fear' response (i.e., defensive reactivity) (Bouton, 2007; Patrick et al., 1993).

Self-report measures. Self-report valence ratings have often been used in tandem with other measures to assess emotional responses to particular stimuli used in experimental procedures (e.g., rating images on the level of emotional response elicited) (Bouton, 2007). Self-report measures have also been extensively used to index trait fear, including the Fear Questionnaire, Fear Survey Schedule, Activation Preference Questionnaire−Harmavoidance, Multidimensional Personality Questionnaire−Harmavoidance, and Zuckerman's Sensation

Seeking Scale (Geer, 1965; Marks & Mathews, 1979; Tellegen & Waller, 2008; Sylvers et a., 2011; Zuckerman, 1994). Support for the validity of these measures has come from several studies that have investigated the structure and association with potentiated startle (Kramer et al., 2012; Vaidyanathan et al., 2009). An analysis by Kramer et al. (2012) examining the structure of Tridimensional Personality Questionnaire—Harmavoidance (TPQ-HA), Sensation Seeking Scale (SSS), Fear Survey Schedule (SSS), and Psychopathic Personality Inventory—Fearless Dominance (PPI-FD) revealed an overarching bipolar dimension (fearfulness/fearlessness) saturating each of the measures and associated with startle reflex potentiation during viewing of threat scenes. Three subfactors were also revealed, "distress", "stimulation seeking", and "sociability" (Kramer et al., 2012). These results can be interpreted as supporting the delineation between emotional fear, as reflected by the "distress" factor, and defensive reactivity, as supported by the "stimulation seeking". Given that Fearless Dominance and not just the Fearlessness subscale of the PPI was included, it is unsurprising that a third factor of "sociability" emerged as well, and should be considered a separable construct from trait fearlessness (Patrick et al., 2009).

Fear Learning. Pavlovian or classical conditioning has been the most widely used paradigm in the study of fear (LeDoux, 2014; Lissek & Grillon, 2015; Öhman, 2008; Sylvers et al., 2010). Pavlovian conditioning refers to a form of associative learning that is ubiquitous across species and has provided a framework for understanding the mechanisms of affective learning. 'Fear conditioning' describes the process by which cues that are associated with threat are learned and come to elicit defensive responding (Bouton, 2007). During acquisition, a neutral stimulus (conditioned stimulus or CS) is presented followed by an inherently aversive stimulus (unconditioned stimulus or US). The US (e.g., electric shock) naturally elicits an unconditioned

response (UR) (e.g., pain) and as the CS (e.g., a tone) is repeatedly paired with the US, the CS comes to elicit a conditioned response (CR) (e.g., freezing). During extinction, the CS is no longer paired with the US. As it is repeatedly presented on its own, the strength of the CR decreases. However, conditioning is often long lasting, and even after extinction spontaneous recovery of the CR to the CS often occurs unless the CS has been associated with another US (e.g., a pleasant stimulus) (Bouton, 2007).

Experimental procedures often utilize differential conditioning paradigms to examine individual differences in acquisition and extinction of fear responses (LeDoux, 2014; Lissek & Grillon, 2015; Patrick, 2018a; Vaiduanathan et al., 2009). Differential conditioning involves the presentation of at least two neutral stimuli (CSs), only one of which is paired with the aversive US+. The CS+ is paired with the US+ and comes to elicit the CR+. The other stimulus (CS-) is never paired with the US+ and serves as a control to measure the strength of the conditioning effects of the CS+ (Bouton, 2007). The assumption has been that the valence of the CS- remains neutral and thus does not come to elicit a response because it does not predict a salient outcome, unlike the CS+. However, the CS- can be interpreted as predicting the absence of the US+ and thus can serves as a safety cue. As a result, the CS- may come to elicit a response (CR-) because of its predictive ability to ensure safety. Thus, differential conditioning has been often used to assess how fear is learned in the context of both threat relevant stimuli (CS+) and safety cues (CS-) (Bouton, 2007).

Fear conditioning and psychopathology. Pavlovian conditioning has been extensively used in clinical research because it provides a central paradigm to explain the development and maintenance of disorders characterized by fear (LeDoux, 2014; Lissek & Grillon, 2015; Lykken, 1995; Nees, Heinrich, Flor, 2014; Öhman, 2008). While fear conditioning is a vital and highly

adaptive mechanism that allows for successful avoidance/escape from threat, unnecessary or overly elevated fear responses can be pathological (Öhman & Mineka, 2001). Maladaptive fear conditioning often involves inappropriate acquisition (i.e., towards nonthreat related stimuli), lack of extinction (e.g., CS no longer predicts the US, but still elicits CR), elevated CRs or URs (e.g., extreme response to minor threat that causes distress and impairment), and overgeneralization (e.g., stimuli similar to the CS, but non threat relevant, elicit CRs) (Lissek & Grillon, 2015; Öhman & Mineka, 2001). Additionally, maladaptive fear conditioning can also involve inhibition of acquisition (e.g, failure to develop CR toward CS) and undergeneralization (e.g., CSs that predict similar USs do not elicit CRs) (Lykken, 1995; Nees, Heinrich, Flor, 2014). Maladaptive fear conditioning has been theorized to play a role in many disorders, most notably anxiety disorders and PTSD (Lissek & Grillon, 2015; Öhman & Mineka, 2001). In general, anxiety disorders have been associated with lack of CS differentiation and overgeneralizations and, in particular, specific phobias have been associated with deficits in extinguishing fear responses (Lissek & Grillon, 2015; Öhman, 2008). PTSD has been associated with increased fear responses toward CSs and USs and hyper CSs differentiation (Nees, Heinrich, Flor, 2014).

Neurobiology of fear. The amygdala has been identified as a crucial area of the brain involved in the fight/flight/freeze response (Davis, 2006; LeDoux, 2014; Olsson & Phelps, 2007; Tovote et al., 2015). The amygdala refers to a network of interconnected nuclei within the temporal lobe. The lateral, basal, and accessory basal nuclei, collectively termed the basolateral amygdala, are involved in affective learning, and the central, medial, and cortical nuclei, termed the amygdaloid complex, surround the basolateral amygdala and are involved in further specialized functions (Davis & Whalen, 2001; Tovote et al., 2015). The lateral nucleus (LA) and the central nucleus (CeA) have been identified as being involved in the acquisition and

expression of defensive reactivity, respectively (LeDoux, 2002; Sah, Faber, Lopez de Armentia, & Power, 2003). The LA receives sensory information from the thalamus and cortex, including sensory information regarding pain, and is where synaptic associations between threat-relevant cues are built (Olsson & Phelps, 2007). The LA projects to the CeA, which mediates output to areas controlling autonomic and somatic responses in the hypothalamus and brainstem (Davis & Whalen, 2001). These connecting structures can thus be understood to represent a central 'fear' circuit that is activated during exposure to threat stimuli and cues (Davis, 2006; Olsson & Phelps, 2007; Tovote et al., 2015).

Support for the role of the amygdala in fear learning and fear reactivity comes from numerous lesion studies in both animals and humans. Early work by Klüver and Bucy (1939) found that removal of the temporal lobes, including the amygdala, in monkeys resulted in dramatic changes in emotional behavior. These monkeys would approach and examine anything in their environment, including inanimate objects, other animals, or people, without hesitation and did not display the usual facial expression or chatter and escape behaviors associated with their healthy counterparts. Subsequent animal studies have also found support for the role of the amygdala in fear conditioning. A study by Goosens and Maren (2001) found that rats with induced lesions to the LA and CeA displayed decreased freezing responses to both contextual and auditory CSs during conditioning. The results suggest that the amygdala is involved in processing both contextual and specific fear relevant cues during acquisition. A study by Koo, Han, and Kim (2004) found that induced lesions to the LA in rats decreased freezing responses to the CS during conditioning, but that lesions to the CeA only mildly decreased freezing to the CS, suggesting that the LA, but not the CeA, was involved in acquisition. These results further support the theory that the LA is involved in receiving sensory input and that the CeA is

involved in output, suggesting that the LA is where the association between the CS and US are formed and that the CeA modulates output.

Similar behavioral changes have been found in humans with amygdala damage, which has provided strong support for the role of the amygdala in affective processing and responding (Davis & Whalen, 2001). A study by Angrilli et al. (1996) found that patients with lesions to the amygdala displayed reduced startle potentiation during conditioning, suggesting that the damage had reduced fear reactivity. A study by LeBar, LeDoux, Spencer, and Phelps (1995) found similar results in patients with lesions who displayed decreased galvanic skin responses during conditioning. Additionally, the amygdala seems to play an important role in the recognition of fear relevant stimuli as many patients with amygdala damage have displayed difficulty recognizing fearful faces, further emphasizing the importance of the amygdala in fear processing (Davis & Whalen, 2001, Marsh & Blair, 2008). Together, both the animal and human studies suggest that the amygdala plays an important role in the learning and expression of defensive reactivity and fear processing.

Summary. Fear has been defined as a basic emotion vital for facilitating escape behavior (fight/flight/freeze) in response to imminent threat (Bouton, 2007; Lang et al., 2000; Öhman & Mineka, 2001). Fear encompasses both conscious and unconscious components and is largely underpinned by circuits in the amygdala (Davis, 2006; Hoppenbrouwers et al., 2016; LeDoux, 2014; Öhman, 2008). Variations in trait fear can be conceptualized along a bipolar dimension of high trait fear (fearfulness) and low trait fear (fearlessness) (Kramer et al., 2012).

Can deficits in fear explain psychopathy?

Deficits in fear have long been posited as an etiologically salient factor in the development of psychopathy, but there remains much debate and disagreement over whether

fearlessness really underpins the disorder (Hoppenbrouwers et al., 2016; Hamilton & Newman, 2018; Newman et al, 2010). Many contemporary scholars have argued that deficits in fear underpin certain psychopathic traits, but not all, while others maintain that the disorder is better explained by deficits in executive functioning (Fowles & Dindo 2009; Hamilton & Newman, 2018; Lykken, 1995; Patrick et al., 2009; Yang & Raine, 2018). More recently, given the demarcation between conscious and unconscious components of fear, some scholars have asked the question whether the emotional experience of fear or defensive reactivity is relevant to psychopathy, with some suggestion that they may be differently associated with psychopathy (Hoppenbrouwers et al., 2016). While there has been much evidence suggesting that deficits in fear are linked to psychopathy, there still remain many questions regarding the nature of this association and whether, as originally theorized, fearlessness can explain psychopathy. The following sections provide (a) an overview of low fear theories of psychopathy, (b) a review of evidence linking fear deficits and psychopathy, and (c) a brief discussion of current questions and controversies surrounding fearlessness and psychopathy.

Low fear theories of psychopathy. Deficits in fear reactivity have been posited as a core deficit by many researcher beginning in the 20th century and continuing to the present (Blair, 2008; Fowles, 2018; Hare, 1965; Lykken, 1995; Patrick, 2001; Patrick et al., 2009). Gray's (1987) original Behavioral Activation and Behavioral Inhibition System (BIS/BAS), later revised by Gray and McNaughton (2000) into Reinforcement Sensitivity Theory (RST), greatly influenced many low fear theories of psychopathy, with the most prominent being Lykken's (1995, 1957) seminal low-fear hypothesis. The following section provides an overview of Gray's model of behavioral activation, Lykken's low-fear hypothesis, the dual processing model of psychopathy, and the Triarchic model perspective.

Reinforcement Sensitivity Theory. Gray's (1987) Behavioral Inhibition and Behavioral Activation System (BIS/BAS), later revised by Gray and McNaughton (2000) into the Revised Reinforcement Sensitivity Theory (RST), provided a framework for understanding personality in terms of three basic motivational systems (Corr, 2004; Depue & Collins, 1999; Gray & McNaughton, 2000; Fowles, 2018). Gray (1987) argued that individual differences in personality could be understood as variations in sensitivity to aversive and appetitive stimuli, which motivated approach and withdrawal behavior in response to punishment and reward. The "behavioral activation system" (BAS) was the reward seeking system and facilitated behavioral approach in response to pleasant or desired stimuli (although, in the original conceptualization it facilitated all behavioral activation toward all stimuli, including aversive stimuli) (Gray, 1987; Fowles, 2018; Lykken, 1995). The "behavioral inhibition system" (BIS) was the anxiety system and inhibited approach behavior in response to aversive stimuli, both conditioned and unconditioned, thus mediating the BAS (Corr, 2004 Fowles, 2018). The "Fight-flight-freeze system" (FFFS), added in the later revision, was the fear system and facilitated withdrawal behavior from aversive stimuli, both conditioned and unconditioned (Corr, 2004; Gray & McNaughton, 2000). Thus personality differences could be understood as individual variations in sensitivity of the BAS, BIS, and FFFS (Corr, 2004; Depue & Collins, 1999).

Originally, primary psychopathy was theorized to arise from an underactive BIS and secondary psychopathy from an overactive BAS (Fowles, 2018; Lykken, 1995). Theoretically from the original RTS framework, a weak BIS would entail decreased sensitivity to aversive stimuli (e.g., pain, failure, social disapproval, loss of money) and consequently result in an inability to inhibit reward motivated behavior, leading to many psychopathic traits including low anxiety, impulsivity, rashness, disinhibition, callousness, and antisocial behavior (Broerman,

Ross, & Corr, 2014; Corr, 2004). Alternatively, a strong BAS would entail increased sensitivity to reward and inability to inhibit reward motivated behavior, also leading to many psychopathic traits including impulsivity, disinhibition, and general externalizing, but potentially with increased anxiety and negative affect depending on the strength of the BIS (e.g., conflict would arise between an overactive BAS and a functioning BIS) (Lykken, 1995; Fowles, 2018).

However, the contemporary RST framework includes both the BIS and the FFFS because of the contemporary delineation between anxiety and fear. The original conceptualization of the BIS conflated anxiety and fear. However, original RST theories of psychopathy posited that insensitivity to aversive stimuli characterized the disorder, which from a contemporary RTS framework corresponds to the FFFS rather than the BIS (Corr, 2004, Gray & McNaughton, 2000; Lykken, 1995). Thus, theoretically, from a contemporary RST framework, psychopathy could arise from a weak FFFS system. A weak FFFS would entail deficits in aversive responding and decreased harm avoidance, leading to behavioral disinhibition, boldness, and potentially some affective deficits (Broerman et al., 2014; Fowles, 2018). However, given that the BAS has been theorized to account for externalizing behavior, psychopathy could also arise from an overactive BAS and potentially an underactive FFFS, with varying strengths of BIS (Fowles, 2018).

Lykken's low-fear hypothesis. Lykken (1995) was greatly influenced by Gray's original BIS/BAS model and similarly theorized that a lack of normal sensitivity to aversive cues was the core etiological factor in the development of psychopathy. Lykken (1995) argued that major deficits in fear specifically could explain each of the criteria identified by Cleckley. Lykken (1995) argued that children with low trait fear, or as he termed it a low "fear quotient", were more at risk of developing psychopathic tendencies because punishment was less effective a

means of promoting pro-social behavior. In Lykken's view, these children required more skilled parenting that emphasized reward over punishment to help develop conscience and appropriate behavior. In these instances a fearless temperament could be channeled into more socially desirable avenues. However, fearless children with less skilled parents who relied on punishment would be harder to control and less likely to learn not to engage in antisocial behavior. As a result fearlessness coupled with inadequate parenting would likely lead to adults who were less inhibited and were unafraid to engage in risky or illegal behavior. In more extreme variants, this temperamental fearlessness would be a serious deficit that greatly inhibited the development of empathy and feelings of shame and guilt. Thus, Lykken (1995) proposed the hypothesis that low fear was the central etiological factor that could explain both affective and interpersonal features as well as the antisocial aspect of psychopathy.

Dual processing model. Fowles and Dindo (2009) proposed that both deficits in defensive reactivity and deficits in regulation control were central etiological factors in the development of psychopathic traits. Fowles and Dindo (2009) argued that given the multifaceted nature of the disorder, distinct etiological pathways underpinned the different factor dimensions of psychopathy. Deficits in defensive reactivity and fear accounted for the affective and interpersonal impairments associated with PCL-R Factor 1 and PPI Fearless Dominance (Fowles, 2018). Poor regulation control of emotion and behavior accounted for the antisociality and disinhibition associated with Factor 2 and PPI Self-Centered Impulsivity (Fowles, 2018; Fowles & Dindo, 2009). While the pathways were distinct and could manifest independently, resulting in fearless temperament or externalizing symptoms, the combination of the two would likely lead to the full manifestation of psychopathic traits (Fowles & Dindo, 2009).

Triarchic Model. Given the multifaceted and dimensional nature of psychopathy, etiological processes underpinning the disorder are likely to be complex and to encompass multiple different pathways (Patrick et al., 2009). From this perspective, Patrick (2018a) has proposed that three cognitive-affective processing deficits underpin psychopathy, as conceptualized by the Triarchic model. Disinhibition and externalizing proneness are underpinned by deficits in executive functioning, which involve poor "top-down" processing and regulation of emotion and behavior. Boldness and inability to learn from negative consequences are underpinned by deficits in threat reactivity. Meanness is underpinned by deficits in empathic responding, which includes inability to recognize and react appropriately to distress cues (e.g., sad or fearful faces), although meanness may also be underpinned by deficits in fear as well as empathy (Marsh et al., 2005; Patrick, 2018a; Patrick et al., 2009).

Empirical links between deficits in fear and psychopathy. There has been much empirical evidence suggesting that deficits in fear may be associated with psychopathy, although there are still many questions regarding the precise nature of this relationship (Blair, 2008; Hare & Quinn, 1971; Hoppenbrouwers et al., 2016; Patrick, 2001; Patrick et al., 1994; Vaidyanathan et al., 2011). The following section provides (a) a summary of Lykken's seminal study, (b) the autonomic, startle potentiation, and conditioning deficit findings, (c) a brief overview of reported amygdala deficits, (d) self-report findings, (e) a discussion of whether affective fear or defensive reactivity deficits characterize psychopathy, and (f) alternative perspectives.

Lykken's 1957 study. Lykken's (1957) original study was the first to empirically test the hypothesis that psychopathic individuals, as assessed utilizing Cleckley's criteria, exhibited decreased avoidance of negative consequences because of deficits in affective reactivity. The study involved a mental maze test designed to assess passive avoidance, a fear conditioning

experiment to assess fear learning and physiological reactivity (measured via skin conductance), and an assessment of trait anxiety and fear differences in psychopathic offenders, neurotic offenders, and healthy controls. The mental maze task involved 20 choice points where one of four levers could be pressed. If the correct lever was pressed a green light would flash. If the wrong lever was pressed a red light would flash and the participant would receive an electric shock. The sequence of correct levers was learned through trial and error, so that with each time through the maze the pattern could be learned and the number of errors would decrease. The 'manifest' task was thus to learn the correct sequence and the 'latent' task was to avoid the shock. The conditioning experiment involved a differential procedure where different tones were used as CSs and an electric shock was used as the US. While Lykken originally termed both scales used in the study 'anxiety' measures, the scale that he constructed operationalized harm avoidance and thus more appropriately should be termed a fear measure. The Taylor Anxiety Inventory was used to assess anxiety and was largely uncorrelated to Lykken's 'anxiety' scale, further supporting the assertion that the scales used in the study assessed different constructs, which Lykken (1957) noted.

The results of the study revealed that psychopathic offenders compared to neurotic offenders and healthy controls did comparatively well at learning the sequence of the mental maze (manifest task), but worse at avoiding the shock (latent task). As expected, healthy controls showed increased skin conductance responses during acquisition and decreased responses during extinction, suggesting successful conditioning. Compared to neurotic offenders and healthy controls, psychopathic offenders showed reduced skin conductance responses during conditioning, suggesting impairments in acquiring conditioned responses to threat cues. In contrast, the neurotic offenders showed increased skin conductance responses during both

acquisition and extinction, suggesting impairments in extinction of defensive responses. Psychopathic offenders scored lowest on trait fear, and psychopathic and healthy controls scored similarly low on anxiety. Neurotic offenders and controls scored similarly on trait fear, and neurotic offenders scored highest on anxiety. Together, the results confirmed the hypothesis that psychopathic individuals were characterized by deceased affective responding and were deficient in conditioned fear learning and passive avoidance (Lykken, 1957).

Autonomic arousal. Much of the early research investigating fear deficits and psychopathy relied on electrodermal and cardiovascular measures, which as mentioned before better index arousal rather than negative valence (Lang et al., 1990; Patrick et al., 1994). However, results from this research were highly fruitful and established that psychopathy was associated with differences in physiological responding to affective stimuli (Vaidyanathan et al., 2008). Most studies consistently found that psychopathy was associated with decreased skin conductance responding to aversive stimuli (Hare, 1965; Hare & Quinn, 1971; Lykken, 1995; Patrick et al., 1994). For example, many formative early studies by Robert Hare and his colleagues found that compared to nonpsychopathic offenders, who showed increased responses, psychopathic offenders reliably showed decreased skin conductance responses in anticipation of electric shocks, suggesting that psychopathic individuals showed decreased anticipatory reactivity toward threat (Hare, 1965; Hare, Frazelle, & Cox, 1978; Hare & Quinn, 1971; Hare, Wood, Britain, & Shadman, 1971). Another seminal study by Patrick et al. (1994) found related results during an affective processing task, in which psychopathic offenders showed decreased physiological responses (electrodermal, cardiac, and facial muscles) toward fearful compared to neutral sentence processing. By comparison, nonpsychopathic offenders showed increased

physiological responding, suggesting that psychopathy was associated with deficits in normal affective processing.

Potentiated startle. There have been many studies investigating fear deficits in psychopathy using potentiated startle paradigms, which have provided evidence that psychopathy is associated with decreased defensive reactivity (Benning, Patrick, and Iacono, 2005; Levenston et al., 2000; Patrick et. al, 1993; Vaidyanathan et al., 2011; Vaidyanathan et al., 2009). Patrick et al. (1993) examined startle blink modulation during affective picture viewing in male sexual offenders divided into nonpsychopathic, psychopathic (elevated scores on both factors), and mixed (elevated score on one factor) groups. Nonpsychopathic and mixed group offenders showed a linear relationship between startle magnitude and slide valence (largest during unpleasant, smallest during pleasant), but psychopathic offenders showed no difference in startle magnitude during unpleasant and pleasant slide presentation (Patrick et al., 1993). Levenston et al. (2000) also examined startle blink modulation during viewing of different categories of affective pictures (erotic, thrilling, threat, victim, and neutral) and found similar results. Nonpsychopathic offenders showed strong potentiation during threat and victim scenes and reduced potentiation during neutral and pleasant scenes, as expected. In contrast, psychopathic offenders showed weak potentiation during threat scenes and absent potentiation during victim and pleasant scenes, suggesting that psychopathy was characterized by decreased defensive responding (Levenston et al., 2000).

However, weak startle potentiation has been associated mostly with the affective and interpersonal traits of psychopathy. For example, Patrick et al. (1993) found that decreased startle potentiation was associated with PCL-R Factor 1 but not Factor 2, and Vaidyanathan, Hall, Patrick, and Bernat (2011) found that decreased potentiation during aversive picture

viewing was associated with PCL-R Factor 1, but not Factor 2 or Antisocial Personality Disorder (ASPD), suggesting that deficits in defensive reactivity were related to the affective and interpersonal traits rather than the antisocial and externalizing traits. Additionally, investigations utilizing the PPI have found similar results. Benning, Patrick, and Iacono (2005) examined startle blink modulation during affective picture viewing and found that high scores on Self-Centered Impulsivity showed a linear relationship between startle magnitude and picture valence (largest during unpleasant, smallest during pleasant) whereas high scores on Fearless Dominance showed increased startle potentiation during neutral picture viewing and inhibited potentiation during pleasant and unpleasant picture viewing, suggesting that the salience of the stimulus (greater arousal) rather than the valence (negative) influenced startle modulation patterns in psychopathy characterized by Fearless Dominance. Vaidyanathan et al. (2009) also found that Fearless Dominance, but not Self-Centered Impulsivity was associated with decreased startle potentiation in a sample of male and female undergraduates. An additional study by Anderson, Stanford, Wan, and Young (2011) examined startle blink modulation during threat relevant (mutilation and attack), neutral, and pleasant picture viewing in female undergraduates and found that low total scores and high Self-Centered Impulsivity scores showed normal potentiated startle modulation (largest during threat relevant, smallest during pleasant), but that high Fearless Dominance scores showed no significant difference in startle magnitude during picture viewing, supporting the previous findings that deficits in defensive reactivity in psychopathy were associated primarily with the affective component.

Fear Conditioning. Many studies utilizing conditioning paradigms have been conducted in order to explore deficits in fear learning and psychopathy, and most have consistently found decreased CRs in psychopathic individuals compared to nonpsychopathic individuals, suggesting

that psychopathy is associated with impaired fear learning (Hare & Quinn, 1994; López, Poy, Patrick, & Moltó, 2013; Lykken, 1967; Nees, Heinrich, & Flor, 2015; Rothermund et al., 2012). Hare and Quinn (1974) examined differences in physiological responding during a differential conditioning experiment with pleasant and unpleasant USs and different tones as CSs and found that psychopathic offenders did not acquire differential electrodermal response compared to nonpsychopathic offenders who did, suggesting that psychopathy was associated with deficits in fear conditioning. Flor, Birbaumer, Hermann, Ziegler, and Patrick (2002) examined deficits in aversive conditioning in a general population sample with neutral faces as CSs and a noxious odor as the US. Startle potentiation, skin conductance, heart rate, corrugator EMG (measure of facial muscle activity associated with aversive stimuli), and valence, arousal and contingency ratings were assessed. Both nonpsychopathic and psychopathic participants showed similar responses to the US. Nonpsychopathic controls showed significant CS+ /CS− differentiations, but psychopathic participants showed no significant differentiation, suggesting that psychopathy was associated with deficits in aversive conditioning (Flor et al., 2002). However, odor stimuli are typically related to disgust rather than fear and so the study provides support for general deficits in conditioning rather than fear conditioning specifically (Bouton, 2007). However, Rothemund, Ziegler, Hermann, Gruesser, Foell, Patrick, and Flor (2012) examined deficits in fear conditioning in psychopathic offenders and healthy controls with neutral faces as CSs and an electric shock as the US. Similar CR measures were assessed. Unlike healthy controls, psychopathic offenders failed to show CS+/CS− differentiation during acquisition despite reporting similar US valence and arousal ratings, providing evidence that psychopathy was associated with deficits in fear conditioning (Rothermund et al., 2012).

There have also been investigations into whether these conditioning deficits are associated with different traits of psychopathy. Veit et al. (2013) found that deficits in conditioning were associated with higher psychopathy scores in general and specifically with elevated scores on PCL-R Factor 1 and the Affective facet, suggesting that affective and interpersonal features of psychopathy were particularly associated with deficits in fear learning. López et al. (2013) examined deficits in fear conditioning in an undergraduate sample utilizing the PPI and found that total scores showed no significant association with differences in CS+/CS− differentiation during acquisition and extinction, but Fearless Dominance scores moderated CS differentiation during acquisition. Low Fearless Dominance scores showed significant CS+/CS− differentiation, but high Fearless Dominance scores showed no CS+/CS− differentiation. Differences in Self-Centered Impulsivity scores were not associated with differences in CS differentiation. Valence and arousal rating for the US were similar across groups and the CS+ was also rated as more predictive across groups. These results support the previous findings that psychopathy, specifically the affective features, is associated with deficits in defensive reactivity. Interestingly, the results also suggest that the contingency between the CS+ and US may be cognitively understood in psychopathy, without eliciting defensive responding (López et al., 2013).

Amygdala deficits. Deficits in amygdala functioning can be inferred to be associated with psychopathy given that, similarly to individuals with amygdala lesions, psychopathic individuals have displayed decreased startle potentiation, impairment in aversive conditioning, and decreased recognition of fearful faces (Blair, 2008; Blair, Meffert, Hwang, & White, 2018; Blair, Peschardt, Budhani, Mitchell, & Pine, 2006; López et al., 2013; Marsh Ambady, & Kleck, 2005; Patrick et. al, 1993; Rothermund et al., 2012; Vaidyanathan et al., 2011; Vaidyanathan et al.,

2009; Wilson et al., 2008). Evidence from a functional magnetic resonance imaging (fMRI) study examining affective processing in psychopathy found that compared to nonpsychopathic individuals, psychopathic individuals showed less activity in the amygdala and other brain areas during an affect word processing task, providing direct support for the association between amygdala deficits and psychopathy (Kiehl et al., 2001). Additionally, several studies have investigated differences in brain structure between psychopathic and nonpsychopathic individuals and have found that psychopathic individuals consistently had reduced amygdala volumes compared to controls, suggesting that deficits in psychopathy may involve structural abnormalities within the amygdala (Ermer, Cope, Nyalakanti, Calhoun, & Kielh, 2012; Yang, Raine, Narr, Colleti, & Toga 2009; Wallace et al., 2014).

Self-report. Different trait dimensions of self-report psychopathy measures have shown differing association with self-report fear related measures, suggesting that fearlessness may be associated with psychopathy depending on which traits are elevated (Benning et al, 2003; Drislane Patrick, & Arsal, 2014; Miller & Lynam, 2012; Neumann, Johansson, & Hare, 2013). Visser, Ashton, and Pozzebon (2012) found that the Self-Report Psychopathy scale, a PCL-R derivative, showed a large association with sensation seeking (accounted for mostly by the Interpersonal Manipulation and Erratic Lifestyle facet), small association with SSS-Thrill and Adventure seeking, small negative association with harm avoidance, and small positive association with trait anxiety and negative affect. In Miller and Lynam's (2012) meta-analysis, both PPI Fearless Dominance and Self-Centered Impulsivity showed a large association with sensation seeking. Marcus, Fulton, and Edens (2012) found that Fearlessness Dominance and Colderheartedness showed a medium negative association with negative emotionality and Self-Centered Impulsivity showed a medium positive association with negative emotionality. Several

studies reported that Boldness, assessed with the Triarchic Psychopathy Measure, showed a small association with sensation seeking, a large positive association with SSS-Thrill and Adventure seeking, a large negative association with harm avoidance, and a medium negative association with trait anxiety and negative affect (Anderson, Sellbom, Wygant, Salekin, & Krueger, 2014; Drislane et al., 2014; Sellbom & Phillips, 2013). These results suggest that the affective component and possibly aspects of the disinhibition component are associated with self-report fearlessness.

Affective fear or defensive reactivity? A recent article by Hoppenbrouwers et al. (2016) has raised an important question regarding whether psychopathy is associated with decreased experience of emotional fear as well as decreased defensive reactivity. Hoppenbrouwers et al. (2016) argued that while there has been substantial evidence suggesting that psychopathy is associated with deficits in the unconscious components of fear (e.g., automatic physiological and behavioral responses to threat), there is less evidence to suggest an association with decreased conscious experience of fear (e.g., affective fear). Hoppenbrouwers et al., (2016) conducted a meta-analysis of thirty-two studies examining how different components of fear were associated with psychopathy, as assessed mainly by either the PCL-R or one of its derivatives, the Self-Report Psychopathy scale (SRP) (Paulhus, Neumann, & Hare, 2017). The results revealed a moderate association between psychopathy and decreased defensive reactivity but an insignificant association with conscious fear. Given that the conscious and unconscious components of fear are separable (LeDoux, 2014), this raises the possibility that while psychopathic individuals may be fearless in a sense (e.g., reckless and willing to engage in dangerous behavior), they may still experience negative emotional states that include fear. A limitation of their study was the reliance on the PCL-R and SRP, which only operationalize one

particular perspective on psychopathy. However, these results have still indicated that psychopathic traits may be differently associated with different components of fear and have raised an important question regarding whether or not psychopathy is characterized by a lack of affective fear.

Alternative perspectives. Although deficits in emotional processing have often been posited as the core etiology of psychopathy, others have argued that deficits in cognitive processing better account for the disorder. Deficits in affect were originally proposed as the etiology because psychopathic individuals did not appear to have cognitive impairments and often seemed psychologically normal and intelligent upon first impression (Cleckley, 1950; Prichard, 1837). Thus their erratic and antisocial behavior could be explained by a lack of emotion that prevented them from understanding and inhibiting their behavior (Cleckley, 1950; Lykken, 1995). Alternatively, their behavior could also be explained by deficits in attention and information processing, which prevent normal behavioral regulation during goal-directed activities, but do not impede verbal reasoning ability or affective expression (Hamilton & Newman, 2018; Wallace, Schmitt, Vitale, & Newman, 2000). The following section provides an overview of the Response Modulation Hypothesis (RMH), one of the dominant cognitive theories of psychopathy, which provides an alternative perspective on the etiology of the disorder.

The response modulation hypothesis. Response modulation has been defined as the automatic direction of attention toward external information during goal-directed behavior (Wallace, Vitale, & Newman, 1999). The incorporation of external information during ongoing goal-directed behaviors allows for reevaluation and enables self-regulation (e.g., behavior can be altered if the situation changes even if the goal is still desired) (Hamilton & Newman, 2018).

According to the Response Modulation Hypothesis, the erratic and disinhibited behavior often displayed by psychopathic individuals can be explained by poor response modulation that results in obliviousness to external cues and lack of reevaluation leading to increased engagement in reckless, impulsive, and maladaptive behavior (Baskin-Sommers & Newman, 2013, Hamilton & Newman, 2018; Wallace et al., 1999). The etiology of psychopathy thus involves attentional abnormalities that prevent inhibitory behavior rather than affective deficits. There has been some empirical evidence supporting the RMH, including a study by Newman et al. (2010) in which psychopathic offenders compared to nonpsychopathic offenders showed reduced potentiated startle when aversive cues were peripheral, but comparable potentiated startle when attention was directed toward the cues, suggesting that attentional deficits rather than affective deficits may characterize psychopathy (Newman & Kross 1986).

Summary. There has been much empirical evidence suggesting that psychopathy is associated with deficits in fear or fear processing. Many studies have consistently found that psychopathy is associated with decreased autonomic responding to aversive stimuli, decreased potentiated startle, poor conditioning, decreased amygdala activation during affective processing, and reduced amygdala volumes (Anderson et al., 2014; Blair et al. 2018; Drislane et al., 2014; Ermer et al., 2012; Hare, 1965; Hare & Quinn, 1971; Kielh et al., 2001; López et al., 2013; Lykken, 1957; Patrick et al., 1993; Patrick et al., 1994; Rothermund et al., 2012). However, the deficits in fear responding have been largely associated with the affective and impersonal components, suggesting that fear deficits may underlie certain psychopathic traits rather than account for all psychopathic traits, as originally theorized by Lykken (1957; 1995). While there has been substantial evidence suggesting that deficits in fear are linked to psychopathy, there remain many questions regarding what the precise nature of this association may be.

Conclusion

Psychopathy has long interested researches because of its paradoxical nature wherein antisociality, social deviance, recklessness, and irresponsibility were 'masked' by an outward appearance of good mental health, superficial affability, and seeming intelligence. However, there has been much debate and contention over which traits ought to define the personality configuration of psychopathy, with some arguing that externalizing and antagonism are the core traits and others arguing that boldness is also an essential feature and ought to be included. As a result, there have been diverse contemporary conceptualizations and operationalizations of psychopathy with overlapping but differing trait configurations. Psychopathy is thus a complex, multifaceted, and contentious disorder. Additionally, the different trait dimensions of psychopathy are likely underpinned by multiple etiologies, which raises the possibility that results from investigations into etiology may vary depending on which trait configuration of psychopathy is identified.

One etiological pathway that has long been posited as central to the disorder has been deficits in normal fear reactivity, and there has been much empirical evidence linking deficits in fear with psychopathy, particularly with the affective/interpersonal and boldness dimensions. However, there remain questions regarding what precisely the nature of this association may be, (a) given that past research has extensively used either the PCL-R or PPI to assess psychopathy, necessitating a need for studies examining fear deficits across different conceptual models in order to gain a comprehensive understanding of the association between fearlessness and psychopathic traits, (b) given that much of the past research utilized total scores, thus potentially obscuring more complex and heterogeneous associations between deficits in fear and different trait dimensions of psychopathy, and (c) given the recent demarcation of affective fear and

defensive reactivity, which has called into question whether psychopathy is associated with deficits in the emotional experience of fear as well as deficits in defensive reactivity.

The Current Study

The primary objective of the current study was to examine the association between different theoretical models of psychopathy and trait fear in order to further elucidate the relationship between psychopathy and fear. Much of the previous research examining fear deficits assessed psychopathy with either the PCL-R or the PPI and used either total scores or Factor 1 and 2 or Fearless Dominance and Self-Centered Impulsivity to examine the relationship between psychopathy and fear deficits. However, given the diversity of contemporary operationalizations and the multifaceted and complex nature of the psychopathy construct, it was important to reexamine how different dimensions of psychopathy from differing theoretical perspectives and models were associated with fearlessness in order to fully explicate the relationship between psychopathy and fear. The current study thus utilized the Comprehensive Assessment of Psychopathic Personality (CAPP), Elemental Psychopathy Assessment (EPA), Self-Report Psychopathy Scale 4 (SRP-4), and Triarchic Psychopathy Measure (TriPM) to operationalize psychopathy because they all stem from differing conceptual frameworks (i.e., the CAPP, Five Factor Model of personality, Hare's four-factor model, and the Triarchic psychopathy model).

The secondary objective of the current study was to examine how psychopathy was associated with different dimensions of fear as well as trait anxiety. While the link between psychopathy and deficits in defensive reactivity has been well established, the association between psychopathy and the emotional experience of fear has been more tenuous, necessitating further investigation (Hoppenbrouwers et al., 2016). The current study utilized a battery of fear

related measures intended to operationalize harm-avoidance, danger seeking, and emotional fear. Additionally, a trait anxiety measure was also included to evaluate the distinction between fear and anxiety and their relevance to different psychopathy models and traits.

Data for the psychopathy, fear, and anxiety measures were collected from a mixed gender undergraduate and community sample. Both self-report and informant report responses were gathered. While self-report inventories are commonly used in psychopathy research, self-report methods have limitations, including only providing one source of information and potentially including inaccurate responses (Klonsky, Oltmanns, & Turkheimer, 2002). By including informant data, the current study took a multi-method approach to understanding these associations, which will increase the reliability of results.

Hypotheses. In general, it was hypothesized that psychopathy total scores would be positively associated with fearlessness and negatively associated with anxiety, but that psychopathy domain scores would be differently and, possibly, divergently associated with fearlessness and anxiety.

Hypothesis 1. The Comprehensive Assessment of Psychopathic Personality (CAPP) comprises six domains; Attachment, Behavioral, Cognitive, Dominance, Emotional, and Self. It was hypothesized that Emotional and Dominance domains would be moderately associated with fearlessness. It was also hypothesized that the Emotional domain would be negatively associated with trait anxiety, given that the domain includes the trait lacks anxiety (Cooke & Logan, 2018; Patrick et al., 2009).

Hypothesis 2. The Elemental Psychopathy Assessment (EPA) encompasses four domains; Antagonism, Emotional Stability, Narcissism, and Disinhibition. It was hypothesized that the Emotional Stability and Narcissism domains would show a large association with

fearlessness and a negative association with trait anxiety, and the Antagonism and Disinhibition domains would show a modest association with fearlessness and moderate positive association with trait anxiety, given previous studies that have found similar associations (Miller et al., 2012; Miller, Hyatt, Rausher, Maples, & Zeichner, 2014).

Hypothesis 3. The Self-Report Psychopathy 4 (SRP-4) scale is a self-report derivative of the PCL-R and comprises four factors; Interpersonal Manipulation, Callous Affect, Erratic Lifestyle, and Criminal Tendencies (Paulhus et al., 2017). It was hypothesized that the Interpersonal Manipulation and Callous Affect domains would be largely associated with fearlessness and negatively associated with trait anxiety, and that the Erratic Lifestyle and Criminal Tendencies domains would be modestly associated with fearlessness (particularly the danger seeking and harm avoidance related measures) and positively associated with trait anxiety, because of the previous finding that deficits in fear and negative emotionality have mostly been associated with the interpersonal/affective components (Fowles & Dindo, 2009; Neumann et al., 2013; Veit et al., 2013).

Hypothesis 4. The Triarchic Psychopathy Measure (TriPM) is an operationalization of triarchic model, which conceptualizes psychopathy along three phenotypic domains; boldness, meanness, and disinhibition (Patrick, 2010; Patrick et al., 2009). It was hypothesized that the TriPM Boldness and Meanness domains would be largely associated with fearlessness and negatively associated with trait anxiety, whereas the TriPM Disinhibition domain would be modestly associated with fearlessness (particularly the danger seeking and harm avoidance related measures) and positively associated with trait anxiety.

Exploratory hypothesis. Given the evidence that psychopathy may be differently associated with defensive reactivity and the emotional experience of fear (LeDoux, 2014), the

association between psychopathy and different dimensions of fear (harm avoidance, danger seeking, and emotional experience) was examined and it was hypothesized that different psychopathy domains might be differently associated with different aspects of fear.

Methods

Participants

The sample consisted of 305 (79% female, 21% male) participants from a mixed student and community sample (89% students, 11% community). Students were recruited from introductory psychology courses at a large university in New Zealand, and community members were recruited from the local area through online advertisements asking for any interested participants over the age of 18 to complete a 1.5 hour survey and nominate informants for a study investigating maladaptive personality traits and the experience of fear. The mean age of the sample was 20.5 years (*SD* = 4.37), ranging from 18 to 51. The ethnic demographic makeup of the sample was as follows: New Zealand European (69.8%), Other European (12.1%), Māori (8.9%), Chinese (6.6%), Indian (3.9%), Pacific Island (2.3%), and Other (14.4%); the total percentage adds up to greater than 100% because participants could identify with multiple options. Two student participants were excluded because they were under 18 years old.

The informant sample consisted of 191 (71% female, 29% male) individuals who were nominated by the participants as people who knew the participant well. The mean informant age was 32.4 years (*SD* = 15.89) ranging from 15 to 69. Relationship status between the participant and informant was as follows: parent (38.2%), friend (38.2%), romantic partner (17.8%), sibling (4.7%), and other relative (1%). The reported number of years the informant had known the participant was as follows: more than 20 years (14.1%), 16-20 years (29.8%), 10-15 years (6.8%), 6-9 years (9.9%), 2-5 years (18.8%), less than 2 years (12.6%), 1 year (5.8%), and less

than 1 year (2.1%). Nine informants were excluded because of excessive amounts of missing data (i.e., measures could not be reliably scored).

Measures

Descriptive and reliability statistics were calculated for all self-report and informant scale scores (see *Appendix A*). Informant EPA and informant CAPP Cognitive and Emotional scales were associated with reliability coefficients smaller than typically accepted ($\alpha < .70$) and therefore findings pertaining to these scales scores should be evaluated with caution. All self-report and additional informant report scales displayed adequate to high reliability coefficients (αs = .70−.95).

Self-report psychopathy measures.

Comprehensive Assessment of Psychopathic Personality−Self-Ratings (CAPP-SR). The CAPP-SR (Sellbom, Cooke, & Shou, 2019) is a 99 item self-report psychopathy measure assessed using a 4-point Likert-type scale from 1 (*false*) to 4 (*true*). The CAPP-SR is an operationalization of the CAPP, which is a comprehensive concept map of 33 symptoms of psychopathy developed using a lexical approach where constructs identified as relevant to the disorder were broadly sampled and translated into natural language (Cooke et al., 2012; Kreis, Cooke, Michie, Hoff, & Logan, 2012). The CAPP-SR yields a total score, six scores that correspond to the six domains identified by the CAPP model: Attachment (e.g., “I feel little or no loyalty to others”), Behavioral (e.g., “I often act without thinking”), Cognitive (e.g., “I don’t trust anyone”), Dominance (e.g., “It is usually best if others just do what I tell them to do.”) Emotional (e.g., “I just don’t feel very strongly for other people”), and Self (e.g., “I deserve special treatment”), and 33 symptom scales that map onto the six domains (Sellbom et al., 2019). Only the total and domains scores were used in the current study

Elemental Psychopathy Assessment−Short form (EPA-SF). The EPA-SF (Lynam, Sherman, Samuel, Miller, Few, & Widiger, 2013) is a 72 item abbreviated version of the 178 item EPA (Lynam et al., 2011), a self-report psychopathy measure assessed using a 5-point Likert-type scale from 1 (*disagree strongly*) to 5 (*agree strongly*). The EPA was developed from a Five Factor Model (FFM) perspective and consists of maladaptive variants of 18 FFM traits that assess psychopathy (Anger, Arrogance, Callousness, Coldness, Disobliged, Distrust, Dominance, Impersistence, Invulnerable, Manipulation, Opposition, Rashness, Self-Assurance, Self-Centered, Self-Contentment, Thrill-Seeking, Unconcern, and Urgency) (Lynam et al., 2011). The EPA-SF yields a total score and four factor scores, which were used in the current study: Antagonism (e.g., "I'm not a particularly sympathetic person"), Emotional Stability (e.g., "I rarely feel nervous"), Disinhibition (e.g., "I quit things pretty easily"), and Narcissism (e.g., "I deserve special treatment"). The EPA-SF maintained the same four factor structure as the longer EPA form, and the correlations between the EPA and EPA-SF have been found to range from .90 to .97 for the factor scores, suggesting good convergent validity between the long and short form version (Lynam et al., 2013). Additionally, internal reliabilities for the EPA-SF have been high, with .96 reported for the total score and .89 to .99 for factor scores (Lynam et al., 2013).

Self-Report Psychopathy Scale 4 (SRP-4). The SRP-4 (Paulhus et al., 2017) is a 64 item self-report psychopathy measure assessed using a 5-point Likert-type scale from 1 (*disagree strongly*) to 5 (*agree strongly*). The SRP was developed as a self-report version of one of the most widely used psychopathy measures, the Psychopathy Checklist−Revised (PCL-R), which assesses interpersonal, affective, lifestyle, and antisocial features of psychopathy (Gordts, Uzieblo, Neumann, Van den Bussche, & Rossi, 2017; Hare, 1985). The current version, the SRP-4, yields a total score and four subscale scores (Interpersonal Manipulation, Callous Affect,

Erratic Lifestyle, and Criminal Tendencies) which correspond to the four facets of the PCL-R. For copyright purposes examples of the questions included in the SRP-4 cannot be displayed. Internal reliabilities for the SRP-4 have been reported as .92 for the total score and .89 and .82 for Interpersonal Manipulation, .87 and .78 for Callous Affect, .85 and .79 for Erratic Lifestyle, .85 and .75 for Criminal Tendencies (Crego & Widiger, 2014; Neal & Sellbom, 2012). The SRP-4 has been strongly associated with conceptually relevant scores of other psychopathy measures (e.g., Crego & Widiger, 2014; Neal & Sellbom, 2012). Additionally, the SRP-4 has been found to have a high association with externalizing symptoms, sensation seeking, and aggression (both proactive and reactive) and has a negative association with Agreeableness and Consciousness from the Five Factor Model domains (Miller et al., 2012; Neal & Sellbom, 2012).

Triarchic Psychopathy Measure (TriPM). The TriPM (Patrick, 2010) is a 58 item self-report psychopathy measure assessed using a 4-point Likert-type scale from 3 (*true*) to 0 (*false*). The TriPM was developed to assess the constructs explicated by the triarchic model of psychopathy, which posits three domains of Boldness (social dominance, fearlessness, stress immunity), Meanness (callousness, interpersonal detachment, manipulativeness), and Disinhibition (impulsivity, lack of self-control, frustration prone) (Patrick et al., 2009). The TriPM yields a total score and three domain scale scores, which were used in the current study. The TriPM Boldness is a 19 item scale (e.g., “I have a knack for influencing people”) and closely corresponds to the Fearless Dominance dimension of the Psychopathic Personality Inventory (PPI) (Lilienfeld & Andrews, 1996; Lilienfeld & Widows, 2005). The TriPM Meanness is a 19 item scale (e.g., “It doesn’t bother me to see someone else in pain”) and the TriPM Disinhibition is a 20 item scale (e.g., “I have a hard time waiting patiently for things I want”). The items for the Meanness and Disinhibition scales were developed from the Externalizing Spectrum

Inventory (ESI; Krueger, Markon, Patrick, Benning, & Kramer, 2007), a measure developed to index disinhibition and antisocial traits. Across various studies, internal reliabilities for the TriPM scales have been high, ranging from .80 to .89 for Boldness, .85 to .90 for Meanness, .80 to .89 for Disinhibition, and .87 to .88 for the total score (Blagov, Patrick, Oost, Goodman, & Pugh, 2016; Sellbom, & Phillips, 2013; van Dongen, Drislane, Nijman, Soe-Agnie, & van Marle, 2017).

Self-report fear and anxiety measures.

***Adolescent Invulnerability Scale (AIS*).** The AIS (Duggan, Lapsley, & Norman, 2000) is a 21 item self-report measure assessed using a 5-point Likert-type scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The AIS was developed to assess risk taking and the sense of invulnerability often associated with adolescence that contributes to reckless behavior. Invulnerability was conceptualized along two domains, danger invulnerability (e.g., "Driving very fast wouldn't be dangerous if I were driving") and psychological invulnerability (e.g., "It is just impossible for me to get my feelings hurt"). The AIS was selected as a measure of fearlessness because it taps into a construct related to Harm Avoidance and risk taking. The AIS yields a total score, which was used in the current study. Previous studies have reported adequate internal reliability for the AIS (α = .87−.79) (Duggan et al., 2000).

Fear Survey Schedule−II (FSS-II). The FSS-II (Geer, 1965) is a 52 item self-report measure assessed using a 5-point Likert-type scale from 1 (*not at all*) to 5 (*very much*). The FSS was developed to assess the level of fear experienced toward various specific fear stimuli (e.g., public speaking, heights, injections, crowds, and blood). The items map onto four categories of common fears, which include impersonal-social events (e.g., "Entering a room where other people are already seated"), blood-death-injury stimuli (e.g., "Dead people"), undesirable

animals and insects (e.g., “Bats”), and agoraphobic fear (e.g., “Large open spaces”) (Arrindell & Emmelkamp 1984; Beck, Carmin, & Henninger, 1998; Wolpe & Lang, 1964). The FSS (reversed coded) was selected as a measure of fearlessness because it has been extensively used to assess phobic fears (Sylvers et al., 2010). The FSS yields a total score, which was used in the current study. The FSS versions have had high internal reliabilities, FSS-II (α = .94) and FSS-III (α = .95−.96) (Arrindell & Emmelkamp, 1984; Geer, 1965; Spiegler & Liebert, 1970). Additionally, elevated scores on the FSS have been significantly associated with greater fear-potentiated startle, providing support that the FSS indexes the fear construct (Cook, Davis, Hawk, Spence, & Gautier, 1992; Kramer et al., 2012).

Fear Questionnaire (FQ). The FQ (Marks & Mathews, 1979) is a 15 item self-report fear measure assessed using a 5-point Likert-type scale from 0 (*would not avoid it*) to 5 (*always avoid it*). The FQ was developed to assess the degree to which fear relevant stimuli are avoided. The items map onto three categories of fear, which include agoraphobia (e.g., “Hospitals”), social phobia (e.g., “Being criticized”), and blood-injury fears (e.g., “Sight of blood”). The 15 item version of the FQ was developed to assess the most common phobias, although additional items were added to include less common fears in subsequent versions (Mark & Mathews, 1979). While there is a high degree of overlap between the FQ and FSS items, the FQ assesses avoidance, which provides a behavioral measure of fear that complements the emotional response assessed by the FSS. Additionally, both the FQ and FSS have been largely associated with other measures that assess phobias, including animals, bodily harm, and physical confinement fears, suggesting good convergent validity, and only moderately associated with trait anxiety and anxiety sensitivity, suggesting adequate discriminate validity (Cutshall & Watson, 2004; Wilson & Hayward, 2006). The FQ (reverse coded) was thus selected as a

measure of fearlessness because it also has been extensively used to assess phobic fear (Cutshall & Watson, 2004). The FQ yields a total score, which was used in the current study. Previous studies have reported adequate internal reliability for the FQ, ranging from .71 to .83 and .83 to .86 (Cox, Swinson, Parker, Kuch, & Reichman, 1993; Oei, Moylan, Evan, 1991).

Multidimensional Personality Questionnaire−Harm Avoidance (MPQ-HA). The MPQ-HA (Tellegen, 1982; Tellegen & Waller, 2008) is a 26 item self-report subscale of the MPQ, an extensively used inventory of normal range personality traits. 10 of the items are assessed *true−false* (e.g., "It might be fun learning to walk a tightrope"). The other 16 items are assessed using a forced choice format (*of these two situations I would dislike more*), where one choice relates to hazards or dangerous situations (e.g., "Being out in a sailboat during a big storm at sea") and the other relates to tedious or unpleasant situations (e.g., "Sitting through a two-hour concert of boring music"). The construct of Harm Avoidance has been defined by a preference to avoid danger and only experience negative emotionality or distress during exposure to danger, which is conceptually distinct from both sensation seeking (propensity to seek out novel or risky situations) and anxiety (sustained negative emotionality) (Tellegen & Waller, 2008). The MPQ-HA (reversed coded) was selected as a measure of fearlessness because it has been extensively used to assess trait fear; higher scores have been associated with increased startle potentiation during unpleasant picture viewing and conditioning, and low scores with the absence of potentiated startle (Corr, Kumari, Wilson, Checkley, & Gray, 1997; Grillon & Ameli, 2001). The MPQ-HA yields a total scale score, which was used in the current study. Previous studies have reported adequate internal reliability for the MPQ-HA (α = .82−84) (Tellegen & Waller, 2008).

Personality Inventory for DSM-5−Risk Taking (PID-5 RT). The PID-5 RT (Krueger, Derringer, Markon, Watson, & Skodol, 2012) is a 14 item self-report subscale of the PID-5,

which is a 220 item measure developed as an alternative hybrid model for the DSM-5 that assesses personality pathology from a dimensional perspective (Quilty, Ayearst, Chmielewski, Pollock, & Bagby, 2013). The PID-5 yields five domain scores (Antagonism, Detachment, Disinhibition, Negative Affectivity, and Psychoticism) and 25 scale scores. The items are assessed using a 4-point Likert-type scale from 0 (*very false*) to 3 (*very true*). The PID-RT scale, which was used in the current study, is part of the Disinhibition domain, and assesses recklessness, willingness to engage in dangerous or risky situations, and lack of concern for resulting consequences or potential harm (e.g., "I do what I want regardless of how unsafe it might be") (APA, 2013, p. 780; Krueger et al., 2012). Previous studies have reported adequate to high internal reliability for the PID-5 RT (α = .87 −.91) (Strickland, Drislane, Lucy, Krueger, & Patrick, 2013; Quilty et al., 2013). Additionally, the PID-5 RT has been found to be associated with externalizing behavior, and it strongly predicted alcohol and drug use, problem behavior, and aggression, which provides further support for the construct validity of the RT scale (Johnson, Sellbom, & Glenn, 2018).

Sensation Seeking Scale−Thrill and Adventure Seeking (SSS-TAS). The SSS-TAS (Eysenck & Zuckerman, 1978; Zuckerman, 1994) is a 10 item subscale of the SSS assessed using a 5-point Likert-type scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The SSS is 40 items and was developed to assess sensation seeking conceptualized as an uninhibited and impulsive form of extraversion, with a desire for novel and complex sensations and experiences (Zuckerman, 1994). The SSS-TAS was selected as a measure of fearlessness for the current study because it indexes a willingness to engage in activities involving speed and danger (e.g., "I would like to try parachute jumping", "I like to dive off the high board"). Additionally, the SSS assesses preference for risk taking activities that are mostly socially acceptable rather than illicit,

which was appropriate for the current study given that the sample was predominantly university students. The SSS-TAS has been negatively correlated with Harm Avoidance, fearfulness, and Fear Survey Schedule-III, and correlated with reduced startle potentiation, suggesting high convergent validity (Eysenck & Zuckerman, 1978; Kramer et al., 2012; Lissek & Powers, 2003). Previous studies have reported adequate internal reliability for the SSS-TAS (α = .82 − .85) (Kramer et al., 2012; Zuckerman & Neeb, 1979).

Sensitivity to Punishment Questionnaire (SPQ). The SPQ (Torrubia, Avila, Molto, & Grande, 1995) is a 24 item self-report scale with items assessed on a forced choice (*yes−no*) format. The SPQ is one of two subscales of the Sensitivity to Punishment and Sensitivity to Reward Questionnaire (SPSRQ). The SPSR was developed to index Gray's original Behavioral Inhibitions and Approach System (BIS/BAS) (e.g., "Do you generally try to avoid speaking in public", "Are you often afraid of new or unexpected situations") (O'Connor, Colder, Hawk, 2004; Torrubia et al., 1995). The SPQ was intended to correspond to the original BIS, but according to Gray's revised model, Reinforcement Sensitivity Theory (RST), which delineates the BIS from the fight/flight/freeze system (FFFS), the SPQ can be understood to index the FFFS and to some degree the BIS because the scale assesses avoidance and sensitivity toward fear relevant situations (Corr, 2016). The SPQ has been highly correlated with phobic fear and negatively associated with PPI Fearlessness, suggesting adequate convergent validity (Perkins, Kemp, & Corr, 2007; Ross et al., 2007). However, a limitation of the SPQ is that it was not based on the revised RST (Corr, 2016). Previous studied have reported adequate internal reliability for the SPQ (α = .76−.86) (Torrubia, Avila, Molto & Caseras, 2001; Torrubia, et al., 1995).

State-Trait Anxiety Inventory−Trait Anxiety Scale (STAI-T). The STAI-T scale (Spielberger, Gorsuch, & Lushene, 1970) is a 20 item subscale of the STAI, a 40 item self-report measure assessed using a 4-point Likert-type scale from 1 (*not at all*) to 4 (*very much so*). The STAI has been extensively used and was developed to assess anxiety conceptualized as feelings of nervousness, apprehension, worry, and tension (Barnes, Harp, & Jung, 2002; Spielberger, 1972). Anxiety was further delineated by Spielberger (1972) into state anxiety, experienced in response to stressful situations, and trait anxiety, a dispositional proneness to experience anxiety generally (e.g., "I take disappointments so keenly that I can't put them out of my mind", "I feel nervous and restless"). The STAI-T has been strongly correlated with the Beck Anxiety Inventory, Negative Affect, and depression in both clinical and non-clinical samples, suggesting high convergent validity (Balsamo et al., 2013; Fydrick, Dowdall, & Chambless, 1992). The STAI-T was included in the current study as a criterion measure because of the distinction between fear and anxiety. In a meta-analysis reviewing the internal reliability of the STAI, Barnes et al., (2002) reported Cronbach's alpha coefficients from 38 studies for the STAI-T ranging from .84 to .96, suggesting high internal reliability for the scale.

Informant psychopathy measures.

Comprehensive Assessment of Psychopathic Personality−Lexical Ratings Scale−Informant Version (CAPP-LRS-I). The CAPP-LRS-I is an informant version of the CAPP-Lexical Rating Scale (Cooke, Hart, Logan, & Michie, 2012). The CAPP-LRS-I is a 33 item measure developed to assess the 33 symptom from the CAPP concept map, which includes 99 descriptive adjectives that correspond to the 33 traits identified as relevant to the psychopathy construct (e.g., "Garrulous (glib, verbose, pretentious)", "Unreliable (undependable, untrustworthy, irresponsible)") (Cooke & Logan, 2015). The 33 symptoms further map onto six

CAPP domains (Attachment, Behavioral, Cognitive, Dominance, Emotion, and Self), which along with the total score, were used in the current study. The informants were asked to rate their participant on a 7-point Likert-type scale from 1 (*not like that at all*) to 7 (definitely like that) on each of the symptom adjectives.

Elemental Psychopathy Assessment−Super Short Form−Informant Version (EPA-SSF-I). The EPA-SSF-I is an adapted version of the EPA-SSF (Collison, Miller, Gaughan, Widiger, & Lynam, 2016), an 18 item brief version of the 72 item Elemental Psychopathy Assessment−Short Form (Lynam et al., 2013). Each of the 18 items of the EPA-SSF corresponds to the 18 psychopathic traits identified by the EPA and loads onto four factors, Antagonism, Emotional Stability, Disinhibition, and Narcissism (Collison et al., 2016). The EPA-SSF was adapted into an informant version for the current study. The items were changed such that all references to the first person ("I") were changed to third person singular ("she" or "he") (e.g., "I don't care if my actions have a negative impact on others" to "She/he doesn't care if hers/his actions have a negative impact on others"). All results pertaining to the EPA-SSF-I found in the current study should be interpreted with caution because of the low reliability.

Triarchic Psychopathy Measure−Boldness Scale− Informant Version (TriPM-B-I). The TriPM-B-I is an adapted version of the TriPM Boldness scale (Patrick, 2010), a 19 item subscale of the TriPM developed to assess the construct of Boldness (social dominance, adventuresomeness, stress immunity). The TriPM Boldness scale was adapted into an informant version for the current study. The items were changed such that all references to the first person ("I") were changed to third person singular ("she" or "he") (e.g., "I can convince people to do what I want" to "She/he can convince people to do what she/he wants"). The TriPM-B-I was assessed using a 4-point Likert-type scale from 3 (*true*) to 0 (*false*). In the interest of brevity,

only the Boldness scale was given to informants because the construct of Meanness and Disinhibition are assessed by the CAPP and EPA.

Informant fear measures.

Fear Questionnaire−Informant Version (FQ-I).

The FQ-I is an adapted version of the Fear Questionnaire (Marks & Mathews, 1979), a 15 item self-report measure developed to assess phobic fears. The FQ was adapted into an informant version for the current study. The items were changed such that all references to the first person ("I") were changed to third person singular ("she" or "he") and informants were asked to rate on a 5-point Likert-type scale how the person they knew well would avoid the FQ items (e.g., "Sight of blood", "Large open spaces", "Speaking or acting to an audience") from 0 (*would not avoid it*) to 5 (*always avoid it*).

Multidimensional Personality Questionnaire−Brief Form−Harm Avoidance−Informant Version (MPQ-BF-HA-I). The MPQ-BF-HA-I is an adapted version of the MPQ-BF-HA (Patrick, Curtin, & Tellegen, 2002), a 12 item brief version of the 26 item MPQ-Harm Avoidance scale (Tellegen, 1982; Tellegen & Waller, 2008). The MPQ-BF-HA-I was adapted from a self-report version into an informant version for the purposes of the current study. All references to the first person ("I") were changed to third person singular ("she" or "he"). 5 items were scored *true−false* and the other 6 items were scored on a forced choice format (of these two situation she/he would dislike more), where one option related to hazardous situations (e.g., "Riding a long stretch of rapids in a canoe") and the other related to tedious or unpleasant situations (e.g., "Waiting for someone who's late").

Sensation Seeking Scale−Thrill and Adventure Seeking Scale−Informant Version (SSS-TAS-I). The SSS-TAS-I is an adapted version of the SSS-TAS (Eysenck & Zuckerman,

1978; Zuckerman, 1994), a 10 item subscale of the self-report Sensation Seeking Scale, which assesses a willingness to engage in activities involving speed and danger. The SSS-TAS was adapted into an informant version for the current study. The items were changed such that all references to the first person ("I") were changed to third person singular ("she" or "he") (e.g., "I sometimes like to do things that are a little frightening" to "She/he sometimes likes to do things that are a little frightening"). The SSS-TAS-I was assessed using a 5-point Likert-type scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

Procedure

The current study was approved by the University of Otago Human Ethics Committee (approval number 18/206). Psychology student participants were recruited through the department research participation program and received a small portion of course credit for participating. Community member participants were recruited via online advertisements and received $20 dollars for participating. After providing written informed consent, student and community participants completed a battery of self-report measures (listed above) on a computer, supervised by a research assistant. Participants were then asked to nominate three potential informants who knew them well and to provide their names and e-mail addresses. Participants did not have to nominate anyone if they did not wish to per ethics requirements (76% of participants provided informants).

The first nominated informant was then contacted via e-mail and provided a link to a shortened and adapted version of the measures the participants received (listed above), which they completed on their personal devices. If the first informant did not respond within two weeks (with a reminder after one week), the second informant was contacted, and then the third. After providing electronic implied informed consent, informants completed the survey and were

entered into a raffle to win a grocery gift card (1 $100 dollar and 20 $20 dollar gift cards were available). Twenty one informants were then randomly selected and mailed gift cards when the study was completed. 86% of nominated informants provided completed responses. Among these, 71.2% were from the first informant listed, 21.5% were from the second, and 7.3% were from the third.

Data Analysis Plan

All data analyses were conducted using IBM SPSS Statistics 24.

Preliminary Analysis. The primary objective of the current study was to examine the associations between various theoretical psychopathy models and forms of fearlessness. In order to begin addressing this objective, initial correlation analyses were conducted between the various psychopathy and fear related measures both within and cross method (see *Appendix B*). First, Pearson correlations were calculated between all psychopathy measures both within and cross method to evaluate to what degree the different models of psychopathy overlapped. Second, Pearson correlations were calculated between the fear related measures both within and cross method to evaluate the relationship between the fear and anxiety scores. Third, Pearson correlations were calculated between all psychopathy and fear related measures both within and cross method to evaluate the relationship between psychopathic traits and fear/fearlessness and anxiety.

Because of the inter-correlations observed between the fear related measures (see Table B4) and the findings of a bipolar fear/fearlessness dimension using similar fear measures in a study by Kramer et al. (2012), exploratory factor analysis was conducted to determine whether the large set of fear related measures could be reduced to broader higher order fear/fearlessness dimensions. The scores from the fear related measures (i.e., Adolescent Invulnerability Scale,

Fear Survey Schedule, Fear Questionnaire, MPQ−Harm Avoidance, PID5−Risk Taking, SSS−Thrill and Adventure Seeking, and Sensitivity to Punishment) were subjected to maximum likelihood factor analysis with oblique promax rotation. Factor solutions were extracted based on the standard eigenvalue (>1), scree plot, and parallel analysis, with the latter being a more objective method for factor extraction (Schmidt, 2011). Parallel analysis compared the eigenvalues from the observed data to those randomly generated considering the number of variables and participants after multiple resamplings (1,000 replications were used). In order to assess fearlessness as opposed to fearfulness, scores on the FSS, FQ, MPQ−HA, and SP were reverse coded for these analyses. The resulting dimensions were then used for the main analysis. Factor loadings were considered notable if the measure loaded |.35| or greater onto the extracted factors. In order to assess fearlessness as opposed to fearfulness, scores on the FSS, FQ, MPQ−HA, and SP were reverse coded. The resulting dimensions were then used for the main analysis. The informant fear measures were not submitted to factor analysis because there were only three scales, which would not have yielded a viable solution. Instead informant fear measures (FSS, FQ, and MPQ-HA) were aggregated based on the self-report factor analysis findings into similar fear dimensions.

Main Analyses. In order to address the primary objective of the current study, analyses were performed to evaluate the association between psychopathy scores and the higher order fear dimensions that were extracted from the factor analysis. To begin, correlation analyses were conducted between psychopathy scores and fear dimensions both within and cross method. First, Pearson correlations were calculated between self-report psychopathy scores, fear dimensions, and trait anxiety. Second, Pearson correlations were calculated between informant report psychopathy scores and informant fear measures. Third, Pearson correlations were calculated

between the self-report psychopathy scores and informant fear dimensions and lastly, between the informant report psychopathy scores and self-report fear dimensions and trait anxiety. The following benchmarks were used to determine if findings from the correlation analyses were meaningful. To account for shared method variance, within-method correlations were only interpreted as meaningful if they reached a moderate effect size magnitude (i.e., |.30| or larger; Cohen, 1992). For cross-method correlations, statistically significant correlations were interpreted as meaningful due to unshared method. Based on a Bonferroni correction for family wise error, a conservative alpha level of $p < .002$ (.05 divided by number of psychopathy scales) was determined and used to evaluate the significance of the correlation coefficients. For the self-report scores a coefficient of $\geq |.22|$ and for the informant and cross method a coefficient of $\geq |.18|$ were significant at $p < .002$.

In order to determine whether the correlation magnitudes between the fear dimensions and trait anxiety differed from one another in relation to the different psychopathy domains, Steiger's (1980) *t*-test for dependent correlations was calculated for all correlations between psychopathy scores and fear dimensions and trait anxiety both within and cross method. First, Steiger's *t*-tests comparing correlation coefficients of the self-report fear dimensions and trait anxiety with the self-report psychopathy scores were calculated. Second, Steiger's *t*-tests comparing correlation coefficients of the informant-report fear dimensions with the informant-report psychopathy scores were calculated. Third, Steiger's *t*-tests comparing correlation coefficients of the self-report fear dimensions and trait anxiety with the informant-report psychopathy scores were calculated. Lastly, Steiger's *t*-tests comparing correlation coefficients for the informant-report fear dimensions with the self-report psychopathy scores were calculated.

To further elucidate the degree to which the different psychopathy domains were related to the different types of fearlessness extracted from the factor analysis, regression analyses were conducted in order to determine the unique contribution of the fear dimensions in predicting psychopathy scores both within and across method by simultaneously entering the predictor variables into the equation. First, self-report psychopathy scores were regressed onto the self-report fear dimensions. Second, informant-report psychopathy scores were regressed onto informant-report fear dimensions. Third, self-report psychopathy scores were regressed onto informant-report fear dimensions. Lastly, informant-report psychopathy scores were regressed onto self-report fear dimensions.

Finally, intra-class correlation analyses were conducted to determine whether the pattern of within-method correlations between the psychopathy scores and fear dimensions were similar across methods. Intra-class correlation coefficients (ICC) were calculated using an average measure, two-way random-effect model, with consistency agreement to determine if the pattern of correlations was similar or not. The following bench marks were used to interpret findings pertaining to the ICC calculations. Based on a 95% confidence interval, values greater than .90 were deemed excellent, .90 to.75 were good, .75 to .50 were moderate, and below .50 were poor (Koo & Li, 2016).

Results

Preliminary Analyses

Results for the initial correlation analyses between all psychopathy and fear related measure scores both within and cross method can be found in *Appendix B* (*see Tables B1-B8*).

Exploratory Factor Analysis. Exploratory factor analysis incorporating all of the self-report fear/fearlessness measures was conducted using maximum likelihood method of extraction

to determine the number of factors underlying the covariation of the scales. Bartlett's test of sphericity was significant and indicated that all the correlations within the correlation matrix were significant (χ 2 (21) = 803.12, $p < .001$). The Kaiser-Meyer-Olkin measure of sampling adequacy confirmed that the strength of the relationships among scales was high (KMO = .82). Two factors were extracted based on the standard scree plot and eigenvalue (>1) criteria and accounted for 67.61 % of the total covariance among the fear/fearlessness scales. A parallel analysis was consistent with this two-factor extraction, as the first three observed eigenvalues were 3.50, 1.23, and 0.69, with the 95th percentile randomly generated eigenvalues being 1.29, 1.18, and 1.10. The two factors were rotated to simple structure through a promax (oblique) method as factors were assumed to be correlated. The PID-5 Risk Taking, SSS−Thrill and Adventure Seeking, MPQ−Harm Avoidance (Reversed), and Adolescent Invulnerability Scale loaded appreciably onto the first factor from .56 to .80, whereas the Fear Survey Schedule (Reversed), Fear Questionnaire (Reversed), and Sensitivity to Punishment (Reversed) loaded appreciably onto the second factor from .62 to .85. The factors were correlated at a large magnitude (r = .52). In summary, the results revealed two higher order fear dimensions, which were labeled Danger Seeking (DS) and Affective Fearlessness (AF), respectively (see Table 6). Additionally, the results also served as the basis for grouping the informant-report fear measures into parallel informant Danger Seeking and Affective Fearlessness dimensions.

Main Analyses

Correlations. Pearson correlations were calculated between psychopathy scores and the two fearlessness dimensions extracted from the factor analysis both within and cross method. Self-report STAI Trait Anxiety was included in the analyses with self-report fearlessness dimensions. Steiger's *t*-tests for dependent correlations were calculated to determine if the

Table 6

Extracted Factor Loadings for Exploratory Factor Analysis with Promax Rotation of Fearlessness Scales

Scales	Danger Seeking	Affective Fearlessness
PID-5 Risk Taking	**.80**	.46
SSS Thrill and Adventure Seeking	**.76**	.38
MPQ Harm Avoidance (Reversed)	**.74**	.46
Adolescent Invulnerability Scale	**.56**	.33
Fear Survey Schedule (Reversed)	.45	**.85**
Fear Questionnaire (Reversed)	.37	**.79**
Sensitivity to Punishment (Reversed)	.44	**.62**

Note. PID-5 = Personality Inventory for DSM-5; MPQ−HA = Multidimensional Personality Questionnaire; SSS = Sensation Seeking Scale. Boldface denotes extracted factors.

fearlessness dimensions and Trait Anxiety correlations were significantly different from one another in relation to the psychopathy domain and total scores.

Self-reported psychopathy, fearlessness, and trait anxiety scores. Results from the correlation analysis between the self-report psychopathy and fearlessness dimensions and STAI Trait Anxiety scores revealed that psychopathy scores were strongly correlated with Danger Seeking, mostly uncorrelated with Affective Fearlessness, and had a differing pattern of correlations with Trait Anxiety (see Table 7). Danger seeking was strongly correlated with all psychopathy domains and total scores (rs = .32−.65, ps < .002), with the exception of CAPP Attachment, CAPP Cognitive, EPA Antagonism, SRP Criminal Tendencies, and TriPM Disinhibition. Affective Fearlessness was mostly uncorrelated with psychopathy domains and total scores, with the exception of EPA Emotional Stability and TriPM Boldness, which were strongly correlated (rs = .56 and .61, respectively, ps < .002). STAI Trait Anxiety was moderately correlated with CAPP Total, CAPP Cognitive, CAPP Emotional, EPA Disinhibition, and TriPM Disinhibition (rs = .30−.35, ps < .002), strongly negatively correlated with EPA Emotional Stability and TriPM Boldness (rs = -.58, -.72, ps < .002), and was mostly uncorrelated with the remaining psychopathy scores. Steiger's t-tests revealed that the correlations between

Danger Seeking and Affective Fearlessness and psychopathy domain and total scores differed significantly in magnitude, with the exception of EPA Emotional Stability and TriPM Boldness, which had similarly strong correlations with Danger Seeking and Affective Fearlessness. Steiger's *t*-tests revealed that the correlations for Trait Anxiety and Danger Seeking with CAPP Total, CAPP Cognitive, CAPP Emotional, EPA Disinhibition, and TriPM Disinhibition were similar in magnitude, and that the correlations for Trait Anxiety with EPA Emotional Stability and TriPM Boldness differed from those of Danger Seeking and Affective Fearlessness.

Informant-report psychopathy and fearlessness scores. Results from the correlation analysis between the informant-report psychopathy scores and fearlessness dimensions revealed that some psychopathy scores were correlated with Danger Seeking and that most psychopathy scores were uncorrelated with Affective Fearlessness (see Table 8). More specifically, Danger Seeking was moderately correlated with EPA Total, EPA Emotional Stability, EPA Disinhibition, and EPA Narcissism (rs = .23−.36, ps < .002) and strongly correlated with TriPM Boldness (r = .53, p < .002). Affective Fearlessness was moderately correlated with EPA Emotional Stability (r = .35, p < .002), strongly correlated with TriPM Boldness (r = .50, p < .002), and unrelated to the other psychopathy domains and total scores. Steiger's *t*-tests revealed that the correlations were similarly strong between Danger Seeking and Affective Fearlessness in relation to EPA Emotional Stability and TriPM Boldness, but differed in relation to CAPP Total, CAPP Behavioral, CAPP Cognitive, CAPP Self, EPA Total, and EPA Disinhibition.

Self-report psychopathy and informant-report fearlessness scores. Results from the correlation analysis between the self-report psychopathy and informant-report fearlessness dimensions (see Table 9) revealed that informant-report Danger Seeking was strongly correlated with self-report TriPM Boldness (r = .50, p < .002), moderately correlated with self-report EPA

Total, EPA Emotional Stability, EPA Narcissism, SRP Erratic Lifestyle, and TriPM Total (*r*s = .25−.36, *p*s < .002), and modestly correlated with self-report EPA Disinhibition and SRP Total (*r*s = .18, .19, *p*s < .002). Informant-report Affective Fearlessness was moderately correlated with self-report EPA Emotional Stability, EPA Narcissism, and TriPM Boldness (*r*s = .21−.27, *p*s < .002). Steiger's *t*-tests revealed that the correlations between informant-report Danger Seeking and Affective Fearlessness and self-report psychopathy domain and total scores differed significantly, with the exception of EPA Emotional Stability and EPA Narcissism, which were similar in magnitude.

Informant-report psychopathy and self-report fearlessness and trait anxiety scores. Results from the correlation analysis between the informant-report psychopathy and self-report fearlessness dimensions and Trait Anxiety (see Table 10) revealed that self-report Danger Seeking was moderately correlated with informant-report EPA Total, EPA Emotional Stability, EPA Narcissism, and TriPM Boldness (*r*s = .29−.38, *p*s < .002) and modestly correlated CAPP Behavioral (*r* = .25, *p* < .002). Self-report Affective Fearlessness was moderately correlated with informant-report TriPM Boldness (*r* = .35, *p* < .002) and significantly correlated with EPA Total, EPA Emotional Stability, and EPA Narcissism (*r*s = .22−.26, *p*s < .002). Self-report Trait Anxiety was strongly negatively correlated with informant-report EPA Emotional Stability and TriPM Boldness (*r*s = -.36, -.38, *p*s < .002) and significantly negatively correlated with EPA Total and EPA Narcissism (*r*s = -.18, -.26, *p*s < .002). Steiger's *t*-tests revealed that the correlations for self-report Danger Seeking and Affective Fearlessness with informant-report psychopathy scores differed significantly, with the exception of EPA Emotional Stability, which was similar in magnitude. Steiger's *t*-tests also revealed that the correlations between self-report Trait Anxiety and Danger Seeking and Affective Fearlessness were all similar in magnitude for

informant-report CAPP scores and EPA Antagonism, but all differed in magnitude for informant-report EPA Total, EPA Narcissism, and TriPM Boldness. The correlation between self-report Trait Anxiety and informant-report EPA Emotional Stability differed in magnitude from the correlations between self-report Danger Seeking and Affective Fearlessness and informant-report EPA Emotional Stability.

Multiple Regression Analyses. Regression analyses were conducted in order to determine the unique contribution of the two fearlessness dimensions in predicting psychopathy scores both within and cross method to further evaluate how different types of fearlessness were relatively related to different psychopathy domains when accounting for their overlap.

Self-report psychopathy and fearlessness dimensions. Regression analyses between the self-report psychopathy and fearlessness dimensions indicated that together the two fearlessness dimensions accounted for .03 to .57 amount of the variance in psychopathy scores with the largest being for TriPM Boldness and the smallest for CAPP Attachment (see Table 7). All self-report psychopathy total and domain scores were uniquely predicted by Danger Seeking (βs = .25−.66), with the exception of CAPP Attachment. Across regression models, most psychopathy scores were not uniquely predicted by Affective Fearlessness, with the exception of EPA Emotional Stability and TriPM Boldness (βs = .41, .44). Surprisingly, Affective Fearlessness also contributed to the prediction of CAPP Total, CAPP Behavioral, CAPP Cognitive, EPA Disinhibition, and TriPM Disinhibition, but in a negative direction (βs = -.21−-.33).

Informant-report psychopathy and fearlessness dimensions. Regression analyses using the informant-report fearlessness dimensions predicting informant-report psychopathy scores indicated that together the two fearlessness dimensions accounted for .01 to .43 amount of the variance in psychopathy scores with the largest being for TriPM Boldness and the smallest for

CAPP Dominance and EPA Antagonism (see Table 8). CAPP Behavioral, CAPP Cognitive, TriPM Boldness, EPA Total, EPA Emotional Stability, EPA Disinhibition, and EPA Narcissism were uniquely predicted by Danger Seeking (βs = .25−.43). Across regression models, psychopathy scores were not predicted by Affective Fearlessness, with the exception of EPA Emotional Stability and TriPM Boldness (βs = .29, .40). Affective Fearlessness also contributed to the prediction of CAPP Behavioral, but in a negative direction (β = -.25).

Self-report psychopathy and informant-report fearlessness dimensions. Regression analyses between the self-report psychopathy and informant-report fearlessness dimensions indicated that together the two fearlessness dimensions accounted for less than .01 to .27 amount of the variance in psychopathy scores with the largest being for TriPM Boldness and the smallest for CAPP Cognitive and CAPP Dominance (see Table 9). Self-report EPA Total, EPA Emotional Stability, EPA Narcissism, SRP Lifestyle, TriPM Total, and TriPM Boldness were uniquely predicted by informant-report Danger Seeking (βs = .24−.45). Across regression models, self-report psychopathy scores were not predicted by informant-report Affective Fearlessness, with the exception of EPA Emotional Stability and TriPM Boldness (βs = .19, .18).

Informant-report psychopathy and self-report fearlessness dimensions. Regression analyses between the informant-report psychopathy and self-report fearlessness dimensions indicated that together the two fearlessness dimensions accounted for less than .01 to .19 amount of the variance in psychopathy scores with the largest being for TriPM Boldness and the smallest for CAPP Cognitive and CAPP Dominance (see Table 10). Informant-report CAPP Behavioral, EPA Total, EPA Emotional Stability, EPA Disinhibition, and TriPM Boldness were uniquely predicted by self-report Danger Seeking (βs = .25−.38). None of the informant-report

psychopathy scores was predicted by self-report Affective Fearlessness, with the exception of TriPM Boldness (β = .25).

Intra-class correlations. Overall results from the intra-class correlation analyses revealed that the pattern of within- and between-method correlations between self-report and informant report psychopathy and fear dimensions were highly consistent (see Table 11). More specifically, the correlation patterns for Danger Seeking self-report and informant report with self-reported psychopathy scores showed excellent consistency (ICC = .94 with 95% confidence interval = .86-.98). The correlation patterns for Affective Fearlessness self-report and informant report with self-report psychopathy showed good consistency (ICC = .85 with 95% confidence interval = .64-.94). The correlation patterns for Danger Seeking informant report and self-report with informant report psychopathy showed excellent consistency (ICC = .92 with 95% confidence interval = .74-.98). The correlation patterns for Affective Fearlessness informant report and self-report with informant report psychopathy showed good consistency (ICC = .81 with 95% confidence interval = .38-.94).

Table 7

Correlation and Regression Analysis for Self-Reported Psychopathy, Fearlessness, and Trait Anxiety Scores

Self-Report	Self-Report						
	Danger Seeking		Affective Fearlessness				Trait Anxiety
	r	β	r	β	*F*	R^2	r
CAPP Total	**.34**$_a$	**.43**	-.03$_b$	**-.21**	1.16	.16**	**.31**$_a$
Attachment Domain	.13$_a$	.19	-.05$_b$	.05	2.79	.03*	**.**24$_a$
Behavioral Domain	**.35**$_a$	**.45**	-.05$_b$	**-.24**	1.88	.17**	.29$_a$
Cognitive Domain	.14$_a$	**.25**	-.17$_b$	**-.27**	0.24	.08**	**.35**$_c$
Dominance Domain	**.36**$_a$	**.39**	.09$_b$	-.08	0.36	.13**	.18$_b$
Emotional Domain	**.32**$_a$	**.37**	.02$_b$	-.13	1.79	.12**	**.30**$_a$
Self Domain	**.38**$_a$	**.46**	.00$_b$	-.19	3.52	.17**	.17$_b$
EPA Total	**.57**$_a$	**.59**	.21$_b$	-.04	6.47	.33**	-.04$_c$
Antagonism	**.**24$_a$	**.31**	-.05$_b$	-.18	1.64	.08**	**.**23$_a$
Emotional Stability	**.47**$_a$	**.28**	**.56**$_a$	**.44**	12.50	.38**	**-.72**$_b$
Disinhibition	**.44**$_a$	**.57**	-.07$_b$	**-.31**	5.37	.27**	**.32**$_a$
Narcissism	**.45**$_a$	**.41**	.27$_b$	.10	9.96	.21**	-.14$_c$
SRP Total	**.54**$_a$	**.57**	.16$_b$	-.08	4.05	.30**	.12$_b$
Interpersonal Manipulation	**.35**$_a$	**.35**	.13$_b$	-.02	1.49	.12**	.12$_b$
Callous Affect	**.45**$_a$	**.45**	.20$_b$	.02	1.01	.21**	.08$_b$
Erratic Lifestyle	**.63**$_a$	**.66**	.19$_b$	-.08	8.38	.40**	.06$_b$
Criminal Tendencies	.21$_a$	**.29**	-.06$_b$	-.18	0.62	.07**	.15$_a$
TriPM Total	**.65**$_a$	**.65**	.28$_b$	.01	14.40	.42**	-.08$_c$
Boldness	**.65**$_a$	**.48**	**.61**$_a$	**.41**	35.40	.57**	**-.58**$_b$
Meanness	**.44**$_a$	**.48**	.11$_b$	-.09	3.67	.20**	.11$_b$
Disinhibition	**.**25$_a$	**.39**	-.17$_b$	**-.33**	2.56	.15**	**.35**$_a$

Note. CAPP = Comprehensive Assessment of Psychopathy; EPA = Elemental Psychopathy Assessment; SRP = Self-Report Psychopathy Scale; TriPM = Triarchic Psychopathy Measure. $N = 305$. a, b, c Indicate significant difference in Steiger's *t-test* ($p < .05$) between correlations. Based on Bonferroni correction, correlations of ≥ .22 are significant at $p < .002$. Boldface denotes *r*s greater than |.30| and βs are standardized and significant at $p < .002$. *r*s reported for Trait Anxiety are simple. *$p < .01$, **$p < .001$.

Table 8

Correlation and Regression Analysis for Informant-Report Psychopathy and Fearlessness Scores

Informant	Informant-Report					
	Danger Seeking		Affective Fearlessness			
	r	β	r	β	*F*	R^2
CAPP Total	.08	.14	-.18$_b$	-.22	5.09	.05*
CAPP Attachment Domain	-.06	-.02	-.14	-.14	1.99	.02
CAPP Behavioral Domain	.23	**.29**	-.18$_b$	**-.25**	11.92	.11**
CAPP Cognitive Domain	.05	**.25**	-.20$_b$	-.22	4.87	.05*
CAPP Dominance Domain	.03	.05	-.09	-.10	1.03	.01
CAPP Emotional Domain	-.03	.01	-.16	-.16	2.51	.03
CAPP Self Domain	.15	.19	-.14$_b$	-.19	5.43	.06*
EPA Total	**.36**	**.36**	.12$_b$	.03	14.40	.13**
EPA Antagonism	-.08	.00	-.07	-.07	0.48	.01
EPA Emotional Stability	**.32**	**.25**	**.35**	**.29**	21.07	.18**
EPA Disinhibition	**.30**	**.33**	-.06$_b$	-.14	11.36	.12**
EPA Narcissism	**.31**	**.29**	.16	.09	11.12	.12**
TriPM Boldness	**.53**	**.43**	**.50**	**.40**	69.63	.43**

Note. CAPP = Comprehensive Assessment of Psychopathy; EPA = Elemental Psychopathy Assessment; TriPM = Triarchic Psychopathy Measure. $N = 191$. Based on Bonferroni correction, correlations of ≥ .18 are significant at $p < .002$. Boldface denotes *r*s greater than |.22| and βs are standardized and significant at $p < .002$.

*$p < .01$, **$p < .001$.

Table 9

Correlation and Regression Analysis for Self-Report Psychopathy and Informant-Report Fearlessness Scores

Self-Report	Informant-Report					
	Danger Seeking		Affective Fearlessness			
	r	β	r	β	*F*	R^2
CAPP Total	.05	.08	-.08	-.10	1.16	.01
Attachment Domain	-.11	-.07	-.15	-.10	2.79	.03
Behavioral Domain	.12	.13	-.05	-.08	1.88	.02
Cognitive Domain	-.05	-.05	-.02	-.01	0.24	.00
Dominance Domain	.05	.06	-.02	-.04	0.36	.00
Emotional Domain	.07	.10	-.10	-.12	1.79	.02
Self Domain	.16	.19	$-.06_b$	-.11	3.52	.04
EPA Total	**.25**	**.26**	$.06_b$	-.00	6.47	.06*
Antagonism	-.06	-.03	-.13	-.12	1.64	.01
Emotional Stability	**.29**	**.24**	**.25**	**.19**	12.50	.12
Disinhibition	**.19**	.22	$-.09_b$	-.14	5.37	.05*
Narcissism	**.27**	**.24**	**.21**	.15	9.96	.10**
SRP Total	**.18**	.21	$-.04_b$	-.09	4.05	.04
Interpersonal Manipulation	.07	.10	-.08	-.11	1.49	.02
Callous Affect	.10	.11	-.01	-.04	1.01	.01
Erratic Lifestyle	**.28**	**.30**	-.00	-.08	8.38	.08**
Criminal Tendencies	.07	.08	-.03	-.05	0.62	.01
TriPM Total	**.36**	**.37**	$.05_b$	-.04	14.40	.13**
Boldness	**.50**	**.45**	$\mathbf{.27}_b$	**.18**	35.40	.27**
Meanness	.13	.16	$-.11_b$	-.15	3.67	.04
Disinhibition	.10	.13	$-.10_b$	-.14	2.56	.03

Note. CAPP = Comprehensive Assessment of Psychopathy; EPA = Elemental Psychopathy Assessment; SRP = Self-Report Psychopathy Scale; TriPM = Triarchic Psychopathy Measure. $N = 191$. Based on Bonferroni correction, correlations of ≥ .18 are significant at $p < .002$. Boldface denotes *r*s greater than |.18| and βs are standardized and significant at $p < .002$.

*$p < .01$, **$p < .001$.

Table 10

Correlation and Regression Analysis for Informant-Report Psychopathy and Self-Report Fearlessness and Trait Anxiety Scores

Informant-Report	Self-Report						
	Danger Seeking		Affective Fearlessness				Trait Anxiety
	r	β	r	β	*F*	R^2	r
CAPP Total	.12$_a$	.10	.10$_a$	.06	.02	.02	.11$_a$
CAPP Attachment Domain	.04$_a$	.01	.09$_a$	.09	.01	.01	.11$_a$
CAPP Behavioral Domain	**.25**$_a$	.24	.11$_a$	.01	.06*	.06*	.12$_a$
CAPP Cognitive Domain	.06$_a$	.02	.04$_a$	.05	.00	.00	.13$_a$
CAPP Dominance Domain	-.01$_a$	-.03	.05$_a$	.06	.00	.00	.10$_a$
CAPP Emotional Domain	.09$_a$	.07	.10$_a$	.07	.01	.01	.14$_a$
CAPP Self Domain	.15$_a$	.13	.10$_a$	.05	.01	.01	-.02$_a$
EPA Total	**.33**$_a$	**.27**	**.26**$_b$	.16	.13**	.13**	**-.18**$_c$
EPA Antagonism	.08$_a$	.06	.08$_a$	.06	.01	.01	.04$_a$
EPA Emotional Stability	**.31**$_a$	**.25**	**.26**$_a$	.16	.12**	.12**	**-.36**$_b$
EPA Disinhibition	**.29**$_a$	**.27**	.14$_b$	.04	.07**	.07**	.05$_a$
EPA Narcissism	.16$_a$	.09	**.22**$_b$	.18	.05*	.05*	**-.26**$_c$
TriPM Boldness	**.38**$_a$	**.28**	**.35**$_b$	**.25**	.19**	.19**	**-.38**$_c$

Note. CAPP = Comprehensive Assessment of Psychopathy; EPA = Elemental Psychopathy Assessment; TriPM = Triarchic Psychopathy Measure. $N = 191$. a, b, c Indicate significant difference in Steiger's *t-test* ($p < .05$) between correlations. Based on Bonferroni correction, correlations of ≥ .18 are significant at $p < .002$. Boldface denotes *r*s greater than |.18| and βs are standardized and significant at $p < .002$. *r*s reported for Trait Anxiety are simple.
$^*p < .01$, $^{**}p < .001$.

Table 11

Intra-Class Correlation Analysis for Fearlessness and Psychopathy Correlation Patterns across Method

	ICC	Confidence Interval Lower Bound	Confidence Interval Upper Bound
Self-Report Psychopathy			
Danger Seeking Self−Informant-Report	.94**	.86	.98
Affective Fearlessness Self−Informant-Report	.85**	.64	.94
Informant-Report Psychopathy			
Danger Seeking Informant−Self-Report	.92**	.74	.98
Affective Fearlessness Informant−Self-Report	.81*	.38	.94

Note. Average Measure, Consistency, 2-Way Random-Effect Model was used to calculate ICCs. ICC = Intra-class correlation coefficient.
*$p < .01$, **$p < .001$.

Discussion

The current study examined the association between different models of psychopathy (CAPP, EPA, SRP-4, TriPM) from different conceptual perspectives (CAPP, FFM, PCL-R, and the triarchic model) and dimensions of fearlessness (danger seeking and affective fearlessness) and trait anxiety using a multi-method design in order to elucidate the relationship between psychopathic traits and fearlessness. Across models, most psychopathy domains were meaningfully associated with danger seeking, but mostly not associated with affective fearlessness, raising questions and implications regarding the role of fearlessness in psychopathy. Most psychopathy domains were not associated with trait anxiety and showed differing associations with trait anxiety compared to fearlessness, reflecting the delineation between anxiety and fear as separable emotions (Sylvers et al., 2011; Tovote et al., 2015). Agreement between self-reported psychopathy and fear scores and informant-report psychopathy and fear scores was high, suggesting that the associations found between psychopathy and fearlessness were likely reliable given the multi-method approach.

Hypotheses

The general hypothesis that psychopathy total scores would be positively associated with fearlessness was only partially supported. Although the danger seeking dimension of fearlessness was generally positively associated with psychopathy total scores from the various perspectives, the affective fearlessness dimension was not significantly associated with any total scores. The findings pertaining to danger seeking were consistent with other self-report studies, which have found that both sensation seeking and low harm avoidance have been positively associated with SRP-4 and TriPM total scores and were theoretically consistent with the characterization of psychopathic individuals as prone to engage in risky and dangerous behavior (e.g., Anderson et al., 2014; Cleckley, 1950; Drislane et al., 2014; Hare & Neumann, 2008; Sellbom & Phillips, 2013; Visser et al., 2015). The findings pertaining to affective fearlessness were somewhat surprising given the theoretical supposition that psychopathy entailed decreased or shallow affective experience (Cleckley, 1950; Lykken, 1995: McCord & McCord, 1948), although consistent with the findings from Hoppenbrouwers et al.'s (2016) meta-analysis, which found that psychopathy was not associated with reduced experience of emotional fear.

The hypothesis that psychopathy total scores would be negatively associated with trait anxiety was not supported. EPA, SRP-4, and TriPM total scores were not associated within and cross method with trait anxiety and the CAPP total score was positively associated with trait anxiety. Previous self-report studies have generally found a small to medium negative association between the EPA, SRP-4, and TriPM total scores and negative emotionality and trait anxiety (Drislane et al., 2014; Miller et al., 2011; Visser et al., 2015). Thus, the current results should be interpreted tentatively as suggesting that whether psychopathy is associated with anxiety may depend on which domain is elevated; it may be that psychopathy is not generally

characterized by lack of anxiety. The hypothesis that different psychopathy scores would show divergent associations with fear dimensions and trait anxiety was confirmed and is discussed in the following sections.

Hypothesis 1. The hypothesis that the Comprehensive Assessment of Psychopathic Personality (CAPP) Emotional and Dominance domains would be moderately associated with fearlessness was partially confirmed given that both had a small positive association with danger seeking but were not associated with affective fearlessness. Additionally, the hypothesis that the Emotional domain would be negatively associated with trait anxiety was not confirmed. Instead, the Emotional domain had a significant positive association with trait anxiety, despite the Emotional domain's inclusion of the symptom "Lacks Anxiety". Moreover, the total CAPP score and Cognitive domain were also positively associated with trait anxiety, suggesting that contrary to other psychopathy measure, the CAPP is positively associated with trait anxiety. Overall, all the CAPP domains except the Attachment and Cognitive domains showed a positive association with danger seeking and none showed a meaningful association with affective fearlessness.

Emotional Stability or Instability? The positive association between the CAPP Total, Cognitive and Emotional domains with trait anxiety brings up an important conceptual distinction between the CAPP model and other psychopathy conceptualizations and potentially raises questions regarding the construct validity of the CAPP model. The Emotional domain of the CAPP was intended to reflect a tendency to experience shallow affect accompanied by mood regulation problems, with the domain symptoms including "lacks anxiety", "lacks pleasure", "lacks emotional depth", "lacks emotional stability", and "lacks remorse" (Cooke et al., 2012). However, this is not reflected in the current results given that the Emotional domain is positively associated with trait anxiety and unrelated to affective fearlessness, suggesting that the

Emotional domain is associated with increased negative affect rather than reduced negative affect. The contradiction between the current results and "lacks anxiety" symptom, may be explained because of the inclusion of other internalizing symptoms (e.g., anhedonia, irritability) in the Emotional domain, which are generally associated with increased anxiety. In any case, the results challenge the validity of the construct of the Emotional domain, as the domain does not seem to assess the intended construct. Additionally, the CAPP model departs from other psychopathy conceptualizations that have explicitly included emotional stability features (e.g., PPI Fearless Dominance, EPA Emotional Stability, TriPM Boldness) as it included emotional dysregulation features (e.g, temperamental, moody); this highlights the importance of not conflating psychopathy measures and raises the questions of whether psychopathy should be characterized by emotional stability or instability as well as whether the CAPP should be revised to better reflect the construct of absence of negative affect as posited in the CAPP and other theoretical perspectives (Cleckley, 1950; Cooke et al., 2012; Hare et al., 2018; Garofalo & Neumann, 2019).

Hypothesis 2. The hypothesis that the Elemental Psychopathy Assesment (EPA) Emotional Stability and Narcissism domains would have a large positive association with fearlessness and a negative association with trait anxiety was partially confirmed. Emotional Stability had a large positive association with danger seeking and affective fearlessness and a large negative association with trait anxiety, consistent with previous studies which have also found a large negative association between Emotional Stability and negative emotionality and neuroticism (Miller et al., 2014; Miller et al., 2011). Narcissism had positive association with danger seeking but was not significantly associated with affective fearlessness and trait anxiety, suggesting that Narcissism may not be associated with lack of negative affect. However, given

that while Miller et al. (2011) found that Narcissism was negatively associated with negative emotionality, but Miller et al. (2014) found that Narcissism was positively associated with negative emotionality, the current null findings are not that surprising given the previous contradictory results.

The hypothesis that Antagonism and Disinhibition would be modestly associated with fearlessness and positively associated with trait anxiety was partially confirmed. Antagonism was not significantly associated with either of the fearlessness dimensions or trait anxiety. Disinhibition was positively associated with danger seeking, but negatively associated with affective fearlessness and positively associated with trait anxiety, suggesting that while disinhibition may be associated with increased sensation seeking and risk taking, it is also associated with increased negative emotionality, which is consistent with the previous finding that increased externalizing is associated with increased internalizing symptoms (Benning et al., 2005; Fowles, 2018; Hicks & Drislane, 2018; Krueger, 1999).

Hypothesis 3. The hypothesis that Self-Report Psychopathy scale (SRP-4) Interpersonal Manipulation and Callous Affect domains would be largely associated with fearlessness and negatively associated with trait anxiety was partially confirmed. Interpersonal Manipulation and Callous Affect were positively associated with danger seeking but not significantly associated with affective fearlessness or trait anxiety. Given that the deficits in fear have been linked to Factor 1 of the PCL-R,(Neumann et al., 2013) and the SRP-4 is a self-report derivative of this measure, and that previous studies have found a negative association between negative emotionality and Interpersonal Manipulation and Callous Affect, it was surprising that interpersonal and affective psychopathy factors did not correspond with both fearlessness dimensions (Vaidyanathan et al., 2011; Veit et al., 2013; Visser et al., 2010). However, the

results are consistent with Hoppenbrouwers et al.'s (2016) findings that the PCL-R and SRP were associated with deficits in defensive reactivity rather than the emotional experience of fear; the results also lend support to the suggestion that psychopathy may be characterized by deficits in the physiological and behavioral responses to fear but not characterized by subjective emotional fearlessness.

The hypothesis that Erratic Lifestyle and Criminal Tendencies would be modestly associated with fearlessness and positively associated with trait anxiety was partially confirmed. Erratic Lifestyle was largely associated with danger seeking but not significantly associated with affective fearlessness or trait anxiety. Criminal Tendencies was not significantly associated with either the fearlessness dimension or trait anxiety. These results are interesting given that Erratic Lifestyle and Criminal Tendencies correspond to PCL-R Factor 2 and are related to the disinhibition domains of other measures. However, unlike EPA Disinhibition and TriPM Disinhibition, which showed a positive association with trait anxiety, Erratic Lifestyle and Criminal Tendencies did not, further highlighting the divergent associations different psychopathy measures can have and suggesting that they ought not to be considered interchangeable.

Hypothesis 4. The hypothesis that TriPM Boldness and Meanness would be largely associated with fearlessness and negatively associated with trait anxiety was partially confirmed. Boldness had a large positive association with danger seeking and affective fearlessness and a large negative association with trait anxiety, as expected. Meanness, however, had a large association with danger seeking but was not significantly associated with either affective fearlessness or trait anxiety. The hypothesis that Disinhibition would be modestly associated with fearlessness and positively associated with trait anxiety was partially confirmed.

Disinhibition was surprisingly not significantly associated with danger seeking and was not significantly associated with affective fearlessness either, but was positively associated with STAI Trait Anxiety, which was consistent with finding that externalizing is often associated with internalizing symptoms (Benning et al., 2005; Fowles, 2018; Hicks & Drislane, 2018; Krueger, 1999).

Does fearlessness underpin meanness? Originally, Patrick et al. (2009) proposed that deficits in fear underpinned both meanness and boldness. Consistent with other low fear theories of psychopathy and supported by findings linking deficits in fear with the affective and interpersonal features of the disorder, fearlessness was proposed as an underlying pathway leading to poor socialization and detachment from others, deficits in empathy, and callousness (Benning et al., 2005; Lykken, 1995; Patrick et al., 1993; Vaidyanathan et al., 2009). However, unlike Boldness, which had a strong positive association with both fearlessness dimensions, Meanness was only associated with the danger seeking dimension in the current study, suggesting that while fearlessness may underpin boldness, the etiological underpinnings of meanness may be more complex. Additionally, EPA Antagonism, which also includes callousness, coldness, and manipulation, was not associated with either fearlessness dimension, further suggesting that the construct of meanness or callous unemotionality may not be underpinned by fearlessness, but instead by deficits in empathetic responding since deficits in fear are separable from deficits in empathy (Marsh et al., 2005; Patrick 2018a). While the finding that psychopathy is associated with decreased recognition of fearful faces has been cited to argue that deficits in fear underpin deficits in empathetic responding in psychopathy, fear has been defined as the response elicited by threat cues and empathy has been defined as responses elicited by distress cues (Marsh & Blair, 2008; Sylvers et al., 2011; Vitacco et al., 2019; Wilson

et al., 2008). Thus, despite the term fear being in the name, fearful faces are better characterized as distress cues rather than threat cues as they elicit empathic responses and approach behavior rather than fearful responses and withdrawal behavior (Marsh et al., 2005). The meanness component of psychopathy may thus be better explained by deficits in empathy rather than deficits in fear.

Exploratory hypothesis. The exploratory hypothesis that psychopathy domain scores might be divergently associated with different dimensions of fear (harm avoidance, danger seeking, and emotional fear) encompassed by the array of fear related measures included in the current study was supported. The two fear dimension that were extracted from the factor analysis, danger seeking and affective fearlessness were differently associated with psychopathy domains. Notably, only danger seeking was consistently associated and uniquely predictive of most psychopathy scores across different conceptualizations. Affective fearlessness was only associated and predictive of EPA Emotional Stability and TriPM Boldness, suggesting that only psychopathy models that explicitly include emotional stability features will be associated with decreased emotional fear.

Summary of Key Findings

Results from the exploratory factor analysis of the self-report fear measures revealed two higher order fearlessness dimensions, which were labeled Danger Seeking and Affective Fearlessness. Danger Seeking included the Adolescent Invulnerability Scale, MPQ Harm Avoidance (reversed), PID-5 Risk Taking, and SSS Thrill and Adventure Seeking. Affective Fearlessness included the Fear Questionnaire (reversed), Fear Survey Schedule (reversed), and Sensitivity to Punishment (reversed). The two factor solution was similar to the higher order

fear/fearlessness dimensions of “stimulation seeking” and “distress” found by Kramer et al. (2012) in a study that used a similar battery of fear related measures.

Results from the correlation analysis between psychopathy scores and the two fearlessness dimensions within and cross method revealed that overall psychopathy domains and total scores were meaningfully associated with danger seeking, but mostly unassociated with affective fearlessness. Danger seeking was meangingfully associated with psychopathy scores, except for EPA Attachment, EPA Cognitive, EPA Antagonism, SRP-4 Criminal Tendencies, and TriPM Disinhibition. Unexpectedly, affective fearlessness was mostly unassociated with psychopathy scores, except for EPA Emotional Stability and TriPM Boldness. Results from the correlation analysis between psychopathy scores and trait anxiety reveled that most psychopathy domain and total scores were unassociated with trait anxiety except for EPA Emotional Stability and TriPM Boldness, which were largely negatively associated with trait anxiety, and CAPP Total, CAPP Cognitive, CAPP Emotional, EPA Disinhibition, and TriPM Disinhibition, which were positively associated with trait anxiety. Overall, Steiger’s *t*-test revealed that the correlations between trait anxiety, danger seeking, and affective fearlessness differed in relation to psychopathy scores, with the exception of EPA Emotional Stability and TriPM Boldness, which were strongly associated with all three (negatively with trait and positively with the fearlessness dimensions).

Results from the regression analysis between psychopathy scores and the two fearlessness dimensions within and cross method revealed that across regression models danger seeking uniquely predicted psychopathy scores, with the exception of CAPP. Affective fearlessness was generally not predictive of psychopathy scores, with the exception of EPA Emotional Stability and TriMP Boldness, which were negatively predicted, and, surprisingly,

CAPP Total, CAPP Cognitive, EPA Disinhibition, and TriPM Disinhibition, which were positively predicted. Results from the intra-class correlations analysis revealed that the pattern of associations for Danger Seeking and Affective Fearlessness with psychopathy scores was consistent within and cross method, providing added support for the reliability of the findings.

General Implications

The primary objective of the current study was to examine the association between different theoretical models of psychopathy and fearlessness in order to further elucidate the relationship between these two constructs. While there have been many studies investigating the role of fear in psychopathy, there have not been investigations examining this association across a comprehensive list of psychopathy models. Were psychopathy models to show differing association with fear it would (a) explain how certain models differed from one another and (b) have implications for etiological models of psychopathy.

First, psychopathy represents a complex and multifaceted disorder, with different perspectives positing different and overlapping trait configurations of 'psychopathy' resulting in many questions regarding how to define and conceptualize the disorder (Hare et al., 2018., Lilienfeld, 2013; Benning et al., 2005; Hicks & Drislane, 2018). While there has been much debate surrounding which trait configuration ought to be considered psychopathy, having a better understanding of the ways in which different models differ from one another is beneficial and allows for a more comprehensive understanding of the disorder, regardless of which definition is favored. Additionally, investigations that include multiple conceptualizations of the disorder are better able to address the complexity of the construct. Second, given that multiple etiologies are likely to underpin psychopathy (Blair, 2008; Patrick, 2018a; Yang & Raine, 2018), understanding which traits or trait dimensions of psychopathy are underpinned by certain

etiological factors is important to ascertain. Different conceptualizations include differing trait configurations and thus one etiological factor may be more relevant to one psychopathy conceptualization than another. An examination across models thus allows for clarification of which factors may underpin which traits and which conceptualizations.

The secondary objective of the current study was to investigate whether different dimensions of fear were associated with psychopathy because of the recent demarcation between defensive reactivity (e.g., automatic physiological and behavioral response toward threat) and the emotional experience of fear (e.g., affective state elicited by threat stimuli) and the recent suggestion that psychopathy may be mostly associated with deficits in defensive reactivity but not affective fearlessness (Hoppenbrouwers et al., 2016; LeDoux, 2014; Öhman, 2008). If psychopathy were only associated with deficits in defensive reactivity and not affective fearlessness it would have implications for both (a) the conceptualization of psychopathy and (b) the etiological debate over whether emotional processing or cognitive processing deficits lie at the core of the disorder.

First, the notion that psychopathy is associated with fearlessness stems from the conceptualization of psychopathic individuals as emotionless or affectively shallow, which has been posited as a core trait by most prominent perspectives (Cleckley, 1950; Hare, 1996; Patrick et al., 2009; Prichard, 1837). Some have even argued that shallow affect, particularly deficits in negative emotionality, was the defining feature of the disorder and what distinguished psychopathy from other disorders characterized by antisociality and externalizing problems (Hicks & Drislane, 2018; Lykken, 1995; Patrick, 2018b). If affective fearlessness were not a core component of the construct this would raise many definitional questions and bring to the forefront the ongoing question of whether secondary psychopathy (elevated externalizing

without affective components) should be considered psychopathy (Hicks & Drislane, 2018; Skeem et al., 2003). Second, some cognitive perspectives of psychopathy have argued that the defensive reactivity deficits associated with psychopathy (e.g., lack of startle potentiation and poor fear conditioning) can be also explained by deficits in attention (Hamilton & Newman, 2018; Wallace et al., 2000). Some cognitive perspectives have argued that the lack of responding toward aversive stimuli results because these stimuli are not attending to due to poor "bottom up" processing rather than insensitivity to aversive cues due to emotional processing deficits (Baskin-Sommers & Newman, 2013). Were fearlessness and decreased negative emotionality not to be included as core traits, it could be argued that cognitive deficits could adequately account for the etiology of psychopathy since these deficits could still explain the deficits in defensive reactivity consistently associated with psychopathy.

Danger seeking and affective fearlessness: Do they reflect the demarcation between defensive reactivity and the emotional experience of fear? The findings from the current study showed that fearlessness can be separated into two dimensions reflecting low harm avoidance and risk taking (Danger Seeking) and low phobic fears and reduced sensitivity to punishment (Affective Fearlessness). However, an important question is whether these dimensions reflect the distinction between defensive reactivity and the emotional experience of fear, because if they do the current findings would have important implications for the role of fearlessness in psychopathy.

Defensive reactivity has been defined as the physiological and automatic behavioral reaction toward threat that facilitates behavioral withdrawal and escape from harm (e.g., fight/flight/freeze response) (LeDoux, 2014; Öhman, 2008). Thus, those with deficits in defensive reactivity would show reduced defensive mobilization (e.g., autonomic and behavioral

changes), reduced behavioral withdrawal or even approach during exposure to threat relevant stimuli, and would be more likely and willing to engage in risking and dangerous activities (e.g., base jumping), because threat would be less likely to elicit aversive reactions facilitating withdrawal. The behavioral aspect of defensive reactivity (withdrawal) could thus be assessed through questions regarding preference for danger seeking, risk taking, and avoidance of threat relevant stimuli, as was done in the current study. However, defensive responding is characterized as largely automatic and unconscious (e.g., jumping at a large sound). Thus assessing the complex behavior of risk taking and danger seeking (e.g., preference for dangerous outdoor activities or reckless driving) likely involves other factors and does not just assess defensive responding, bringing into question whether questionnaires provide a valid way for assessing deficits in defensive reactivity. However, risk taking and danger seeking are theoretically underpinned by individual variation in defensive reactivity and have been associated with reduced startle potentiation (Kramer et al., 2012; Lissek & Powers 2003; Öhman, 2008; Sylvers et al., 2010). It can thus be argued that the Danger Seeking dimension of the current study provides an indirect measure of defensive reactivity and can be tentatively interpreted as corresponding to low defensive reactivity.

The emotional experience of fear has been separated from the automatic response to threat and has been defined as the conscious experience of negative affect elicited by imminent threat (perceived or real) (LeDoux, 2014; Sylvers et al., 2010). Thus, those with reduced emotional fear would be expected to report reduced subjective experience of negative affect toward threat relevant stimuli. The measures included in the Affective Fearlessness dimensions (Fear Survey Schedule, Fear Questionnaire, and Sensitivity to Punishment) largely assessed reported subjective feelings of fear toward various fear stimuli and thus conceptually the

Affective Fearlessness dimensions provides a valid measure of emotional fearlessness. However, one issue to address was that while the Sensitivity to Punishment scale includes questions regarding fear it also appears to be contaminated with questions concerning anxiety (e.g., assessing worry) and was largely correlated with STAI Trait Anxiety unlike the other fear related measures (see *Appendix B*). With this confound in mind, the Affective Fearlessness dimension can still be understood as providing a measure of emotional fearlessness. In conclusion, the Danger Seeking and Affective Fearlessness dimensions of the current study can tentatively be considered to reflect the demarcation between defensive reactivity and the emotional experience of fear; findings pertaining to their association with psychopathy however should be viewed as suggestive rather than definitive evidence that psychopathy may be divergently associated with defensive reactivity and the emotional experience of fear.

Implications for the low-fear hypothesis. Lykken (1995) argued that primary psychopathy was defined by shallow affect and was reflected by Cleckley's (1950) conceptualization of the disorder as a masked pathology wherein deviance, recklessness, and antisociality were masked by the appearance of good mental health and affability. Lykken (1995) posited that deficits in normal affective experience, specifically a lack of fear, distinguished primary psychopathy from other personality pathologies associated with antisociality. While recklessness, impulsivity, and antisocial behavior typical of psychopathy could arise from other etiological pathways (e.g., a strong Behavioral Activation System) the main etiology of primary psychopathy was deficits in fear reactivity, which resulted from decreased sensitivity to aversive cues and led to deficits in learning from negative experiences and difficulty discouraging antisocial behavior (Lykken, 1957; 1995). Thus, Lykken proposed the low-fear hypothesis of psychopathy and argued that the development of all the traits identified by Cleckley could be

explained by an inherently fearless temperament. While previous empirical research has consistently found that psychopathy (often assessed utilizing the PCL-R or PPI) has been associated with deficits in defensive responding and processing, there has been evidence that these deficits are largely associated with the affective and interpersonal components (Blair et al., 2018; Hare & Quinn, 1971; Kiehl et al., 2001; López et al., 2013; Lykken, 1957; Patrick et al., 1993; Rothermund et al., 2012). While deficits in fear may be an important etiological factor, they likely do not account for a unitary etiology of psychopathy, suggesting that Lykken (1995) was potentially incorrect in his assertion.

The low-fear hypothesis has also been criticized from cognitive perspectives (Hamilton & Newman, 2018; Baskin-Sommers & Newman, 2013), but has most recently been challenged by Hoppenbrouwers et al.'s (2016) meta-analysis findings that psychopathy was not associated with decreased affective experience of fear, only reduced defensive reactivity. Lykken (1957, 1995) proposed his low-fear theory before the demarcation between the automatic (defensive reactivity) and conscious (emotional experience) components of fear (LeDoux, 2014), thus the findings from Hoppenbrouwers et al. (2016) could be interpreted as partially confirmatory of the low-fear hypothesis. However, given that fear was not demarcated it was implied that fearlessness included a lack of the affective experience and was the defining feature of primary psychopathy (Lykken, 1995). The findings from Hoppenbrouwers et al. (2016) can thus be interpreted as contradictory to the low-fear hypothesis, similar to the result of the current study.

Indeed, although the Danger Seeking component of fearlessness was associated with most psychopathy scores across different theoretical models, Affective Fearlessness was only associated with the emotional stability/boldness features (EPA Emotional Stability and TriPM Boldness), suggesting that unless emotional stability or boldness is included in a the constellation

of psychopathy traits, deficits in affective or emotional experiences of fear are not associated with psychopathy. Because some have argued that the deficits in defensive reactivity associated with psychopathy are better accounted for by deficits in cognitive processing (Hamilton & Newman, 2018; Baskin-Sommers & Newman, 2013), the results from the current study can be interpreted as indicating that subjective emotional fearlessness should not be considered *the* contributing mechanism in psychopathy and that the low-fear hypothesis ought to be reconsidered insofar as such processing is considered.

However, there is another alternative interpretation of the current study's findings and the low-fear hypothesis given that only EPA Emotional Stability and TriPM Boldness were associated with both fearlessness dimensions. Lykken (1995) argued that primary psychopathy was defined by lack of negative affect, which corresponded to Cleckley's (1950) conceptualization, and some have argued that the Fearless Dominance/boldness construct captures the 'mask' aspect of the disorder and distinguishes psychopathy subtypes and psychopathy from ASPD (Hicks & Drislane 2018; Lilienfeld et al., 2012; Lilienfeld et al., 2018; Lykken, 1995; Patrick, 2018a; Patrick et al., 2009). Thus, it can be argued that Lykken's (1995) conceptualization of primary psychopathy could correspond to contemporary models that include Fearless Dominance/boldness features (e.g., EPA and TriPM). The result from the current study can thus be interpreted as consistent with Lykken's (1995) assertion that primary psychopathy would be negatively associated with fear and that secondary psychopathy, defined mostly by impulsivity and antisociality, would be positively associated with negative affect. Thus the current findings can be interpreted as partially in support of the low-fear hypothesis, given that psychopathy as a multifaceted disorder is unlikely to have a unitary etiology.

Strengths and Limitations

The main strength of the current study was that it was the first to compare such a comprehensive inclusion of psychopathy perspectives and large number of fear/fearlessness measures. A second strength of the current study was that it took a multi-method approach (both self-report and informant-report data was included) to improve the reliability of the results and overcome some of the limitations presented by studies that utilize only self-report or one point of data.

However, there are two major limitations of the current study that should be considered. First, the secondary objective of the current study was to examine the association between different dimensions of fear and psychopathy because of the recent demarcation between defensive reactivity and affective fear. Given that there has been much empirical support linking deficits in defensive reactivity with psychopathy, the main question of the current study was whether affective fearlessness was associated with psychopathy, which the self-report measures of phobic fear assess. However, the current study did not include a direct measure of defensive reactivity (e.g., physiological responses or startle potentiation), thus preventing any direct comparison between defensive reactivity and affective deficit in psychopathy and limiting the implications of the current study. An improved research design of the current study would have been to include a measure of defensive reactivity (e.g., assessing fear-potentiated startle responses, autonomic activity), and to compare the association between defensive reactive and affective fear with psychopathy. A future study could test whether startle potentiation or affective fearlessness/fearfulness were better predictors of psychopathic traits.

Second, the sample of the current study was predominately made up of young university students, despite the inclusion of community member participants. The lack of diversity within

the sample thus poses a limitation to the generalizability of the current findings. An improved research design would have been to include more community members with more demographic diversity as well as participants from additional populations (e.g., forensic, correctional) with greater variability in psychopathy scores on the higher end of the dimension. The findings from the current study do provide a meaningful comparison across populations given that many studies investigating psychopathy and deficits in fear have been in forensic samples, but some may undoubtedly question the utility of studying psychopathy in a student population given that the social and legal impairments often associated with psychopathy would potentially be decreased in the current sample. Nevertheless, dimensional models of personality pathology are becoming more and more dominant and indicate that psychopathic traits are best understood as existing on a continuum that varies by degrees across the general population. Psychopathy as a construct has repeatedly been found to be dimensional. (Edens et al., 2006; Lilienfeld, 2013; Patrick et al., 2018b). Therefore, investigations involving general populations samples, including students, is appropriate and still provides meaningful results even if the range at the higher end of dysfunction might be restricted.

Future Directions

The findings from the current study demonstrate that there are still many questions regarding how fearlessness may underpin certain psychopathy traits and more generally how the difference between affective fear and defensive reactivity may account for other disorders often associated with fear. Based on the current findings, future research should further examine the association or lack thereof between the emotional experience of fear and psychopathy and explore which traits are associated with defensive reactivity deficits compared to affective fearlessness deficits. Given that the automatic and conscious components of fear are distinct and

separable, an interesting question to address might be why a trait like boldness would be associated with both. Additionally, given that maladaptive fear responding is posited as an important and defining feature of other disorders, including PTSD and some anxiety disorders, future research should explore how differences regarding defensive reactivity and affective fear are associated with and contribute to psychopathology more generally.

Conclusion

The findings from the current study that different trait domains of psychopathy from different conceptual perspectives were differently associated with fearlessness and trait anxiety raised two important implications for etiological investigations of psychopathy. First, different trait dimensions of psychopathy were differently associated with fearlessness and anxiety, highlighting that psychopathy represents a complex configuration of separable trait dimensions that may have different etiologies. Etiological research should thus consider that an accurate understanding of the etiological factors involved in the development of psychopathy should be assessed at the domain level and that use of only total scores may be inappropriate for etiological investigations because they may obscure the complex and potentially divergent associations between criterion factors and psychopathy traits. Much of the previous research on psychopathy and deficits in fear have relied on total scores, which given the current findings, suggests that these findings should not be considered as conclusive one way or another and that further research at the domain level should be encouraged.

Second, different domains from different conceptual models of psychopathy were differently associated with fearlessness and anxiety, highlighting that ‘psychopathy’ represents a heterogeneous personality construct with overlapping but possibly different trait configurations emphasized by different conceptual perspectives. Etiological research should thus consider that

psychopathy measures from different perspectives are not interchangeable and that which measure is selected may account for differences in findings from studies unitizing different measures of psychopathy. Etiological investigations utilizing only one measure of psychopathy should thus be aware that this is a possible limitation and that the findings might not generalize across differencing theoretical models of psychopathy.

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Appendix A

Table A1

Psychometric Properties of Self-Report Psychopathy Measures

Scale	*N*	*M*	Min	Max	*SD*	Skewness	Kurtosis	α
CAPP Total	307	1.84	1.17	2.98	.32	.42	-.22	.95
Attachment Domain	307	1.53	1.00	2.83	.38	.77	.18	.79
Behavioral Domain	307	1.90	1.11	3.17	.38	.43	.07	.81
Cognitive Domain	307	1.93	1.00	3.20	.39	.36	-.07	.78
Dominance Domain	307	1.85	1.00	3.50	.45	.60	.22	.86
Emotional Domain	307	1.85	1.13	3.20	.36	.57	.21	.70
Self Domain	307	1.98	1.05	3.19	.39	.21	-.33	.81
EPA Total	306	2.33	1.49	3.65	.39	.49	.21	.91
Antagonism	306	1.95	1.00	4.15	.54	.99	1.27	.88
Emotional Stability	306	2.85	1.00	5.00	.74	.30	.17	.86
Disinhibition	306	2.26	1.13	4.25	.54	.36	-.05	.87
Narcissism	306	2.52	1.25	4.25	.53	.28	.14	.74
SRP Total	306	2.12	1.33	4.06	.42	.78	1.35	.91
Interpersonal Manipulation	306	2.32	1.13	4.63	.59	.56	.50	.84
Callous Affect	306	2.11	1.00	4.56	.51	.87	1.98	.79
Erratic Lifestyle	306	2.59	1.25	4.56	.61	.32	-.02	.82
Criminal Tendencies	306	1.48	1.00	3.81	.44	1.33	2.59	.72
TriPM Total	307	56.25	14	121	17.12	.69	1.02	.88
Boldness	307	28.77	8.00	54	8.72	.13	-.06	.85
Meanness	307	11.24	0	53	7.81	1.22	2.74	.88
Disinhibition	307	16.24	1.00	47	7.96	.87	.73	.83

Note. CAPP = Comprehensive Assessment of Psychopathy; EPA = Elemental Psychopathy Assessment; SRP = Self-Report Psychopathy Scale; TriPM = Triarchic Psychopathy Measure.

Table A2

Psychometric Properties of Self-Report Fear and Anxiety Measures

Scale	*N*	*M*	Min	Max	*SD*	Skewness	Kurtosis	α
Adolescent Invulnerability Scale	305	2.06	1.00	4.76	.60	.96	1.46	.89
Fear Survey Schedule	305	2.09	1.04	3.35	.48	.36	-.26	.93
Fear Questionnaire	305	1.71	0	5.07	.97	.62	.30	.81
MPQ−Harm Avoidance	305	1.64	1.08	2.00	.19	-.52	-.23	.82
PID5−Risk Taking	305	1.40	.14	2.93	.53	.27	-.14	.89
SSS−Thrill and Adventure Seeking	305	3.33	1.10	5.00	.91	-.16	-.57	.88
Sensitivity to Punishment	305	.53	0	.96	.22	-.06	-.77	.83
Trait Anxiety	305	2.23	1.00	3.80	.56	.38	.07	.92

Note. PID-5 = Personality Inventory for DSM-5; MPQ−HA = Multidimensional Personality Questionnaire; SSS = Sensation Seeking Scale.

Table A3

Psychometric Properties of Informant Psychopathy and Fear Measures

Scale	*N*	*M*	Min	Max	*SD*	Skewness	Kurtosis	α
CAPP Total	191	2.06	1.00	5.09	.76	1.32	2.06	.93
CAPP Attachment Domain	191	1.55	1.00	5.00	.78	1.98	3.78	.77
CAPP Behavioral Domain	191	2.02	1.00	6.00	.91	1.46	3.04	.76
CAPP Cognitive Domain	191	3.37	1.00	6.40	1.01	1.10	1.30	.69
CAPP Dominance Domain	191	1.81	1.00	6.17	.89	1.65	3.39	.82
CAPP Emotional Domain	191	2.19	1.00	4.60	.82	.64	-.04	.52
CAPP Self Domain	191	2.38	1.00	6.00	1.07	.97	.68	.83
EPA Total	191	2.31	1.28	3.65	.41	.57	.38	.68
EPA Antagonism	191	1.78	1.00	3.60	.54	.78	.62	.57
EPA Emotional Stability	191	3.03	1.00	5.00	.83	-.18	-.56	.65
EPA Disinhibition	191	2.14	1.00	4.20	.61	.50	.27	.57
EPA Narcissism	191	2.70	1.00	4.50	.69	.32	-.17	.50
TriPM Boldness	191	31.99	14.00	56.00	8.36	.05	-.34	.85
Fear Questionnaire	191	1.75	1.00	3.73	.43	1.03	1.60	.78
MPQ−Harm Avoidance	191	1.43	1.08	1.83	.15	.39	.19	.78
SSS−Thrill and Adventure Seeking	191	3.01	1.00	5.00	.94	-.09	.39	.91

Note. CAPP = Comprehensive Assessment of Psychopathy; EPA = Elemental Psychopathy Assessment; TriPM = Triarchic Psychopathy Measure; MPQ−HA = Multidimensional Personality Questionnaire; SSS = Sensation Seeking Scale.

Appendix B

Table B1

Self-Report Psychopathy Correlation Matrix (page 1)

Scale	1	2	3	4	5	6	7	8	9	10	11	12
CAPP Total	–											
Attachment Domain	.77**	–										
Behavioral Domain	.80**	.51**	–									
Cognitive Domain	.82**	.52**	.76**	–								
Dominance Domain	.87**	.61**	.56**	.62**	–							
Emotional Domain	.84**	.69**	.58**	.58**	.67**	–						
Self Domain	.79**	.45**	.54**	.52**	.71**	.59**	–					
EPA Total	.75**	.55**	.60**	.54**	.70**	.67**	.61**	–				
Antagonism	.77**	.77**	.46**	.55**	.71**	.73**	.55**	.76**	–			
Emotional Stability	-.02	-.03	-.05	-.15**	.07	.04	.01	.40**	.06	–		
Disinhibition	.70**	.43**	.73**	.62**	.54**	.56**	.54**	.79**	.52**	-.04	–	
Narcissism	.51**	.26**	.36**	.33**	.54**	.44**	.51**	.77**	.41**	.28**	.51**	–
SRP Total	.77**	.60**	.63**	.57**	.72**	.67**	.58**	.79**	.70**	.20**	.67**	.54**
Interpersonal Manipulation	.69**	.54**	.45**	.48**	.77**	.56**	.56**	.65**	.69**	.16**	.45**	.45**
Callous Affect	.67**	.63**	.46**	.44**	.60**	.68**	.46**	.68**	.71**	.24**	.47**	.44**
Erratic Lifestyle	.57**	.28**	.63**	.48**	.49**	.46**	.44**	.66**	.33**	.21**	.71**	.50**
Criminal Tendencies	.45**	.44**	.38**	.37**	.35**	.37**	.32**	.43**	.45**	.01	.40**	.26**
TriPM Total	.70**	.49**	.58**	.45**	.68**	.58**	.59**	.82**	.60**	.36**	.62**	.67**
Boldness	.12*	-.04	.05	-0.07	.26**	.12*	.24**	.44**	.09	.71**	.05	.52**
Meanness	.73**	.67**	.52**	.49**	.71**	.67**	.52**	.74**	.75**	.17**	.55**	.50**
Disinhibition	.64**	.44**	.70**	.56**	.48**	.46**	.48**	.56**	.44**	-.18**	.73**	.38**

Note. CAPP = Comprehensive Assessment of Psychopathy; EPA = Elemental Psychopathy Assessment; SRP = Self-Report Psychopathy Scale; TriPM = Triarchic Psychopathy Measure. *$p < .05$, **$p < .01$, ***$p < .001$.

Table B1

Self-Report Psychopathy Correlation Matrix (page 2)

Scale	13	14	15	16	17	18	19	20	21
CAPP Total									
Attachment Domain									
Behavioral Domain									
Cognitive Domain									
Dominance Domain									
Emotional Domain									
Self Domain									
EPA Total									
Antagonism									
Emotional Stability									
Disinhibition									
Narcissism									
SRP Total	–								
Interpersonal Manipulation	.82**	–							
Callous Affect	.84**	.63**	–						
Erratic Lifestyle	.78**	.47**	.55**	–					
Criminal Tendencies	.66**	.40**	.44**	.34**	–				
TriPM Total	.79**	.64**	.66**	.66**	.47**	–			
Boldness	.33**	.30**	.30**	.33**	.06	.60**	–		
Meanness	.76**	.66**	.74**	.51**	.43**	.84**	.29**	–	
Disinhibition	.59**	.39**	.37**	.55**	.52**	.66**	-.08	.51**	–

Note. CAPP = Comprehensive Assessment of Psychopathy; EPA = Elemental Psychopathy Assessment; SRP = Self-Report Psychopathy Scale; TriPM = Triarchic Psychopathy Measure.
*$p < .05$, **$p < .01$, ***$p < .001$.

Table B2

Informant Psychopathy Correlation Matrix

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13
CAPP Total	–												
CAPP Attachment Domain	.79**	–											
CAPP Behavioral Domain	.78**	.47**	–										
CAPP Cognitive Domain	.85**	.59**	.73**	–									
CAPP Dominance Domain	.85**	.69**	.51**	.62**	–								
CAPP Emotional Domain	.82**	.65**	.53**	.64**	.67**	–							
CAPP Self Domain	.86**	.60**	.61**	.62**	.75**	.62**	–						
EPA Total	.59**	.45**	.50**	.36**	.56**	.43**	.60**	–					
EPA Antagonism	.61**	.58**	.37**	.45**	.62**	.51**	.51**	.70**	–				
EPA Emotional Stability	-.22**	-.07	-.20**	-.31**	-.19**	-.22**	-.10	.27**	-.14*	–			
EPA Disinhibition	.62**	.37**	.71**	.50**	.48**	.43**	.55**	.78**	.53**	-.14	–		
EPA Narcissism	.38**	.29**	.24**	.16*	.44**	.29**	.50**	.75**	.35**	.16*	.41**	–	
TriPM Boldness	-0.14	-.14*	-.07	-.24**	-.09	-.18*	0.03	.36**	-0.12	.71**	.03	.41**	–

Note. CAPP = Comprehensive Assessment of Psychopathy; EPA = Elemental Psychopathy Assessment; TriPM = Triarchic Psychopathy Measure;
*$p < .05$, **$p < .01$, ***$p < .001$.

Table B3

Cross Method Psychopathy Correlation Matrix

Self -Report	Informant Report												
	CAPP -T	CAP P-A	CAPP -B	CAPP -C	CAPP -D	CAPP -E	CAPP -S	**EPA -T**	EPA -A	EPA -ES	EPA -D	EPA -N	**TriP M-B**
CAPP Total	.33**	.34**	.32**	.26**	.21**	.25**	.27**	.27**	.30**	.02	.25**	.09	.01
Attachment Domain	.28**	.39**	.17*	.22**	.20**	.28**	.16*	.16*	.32**	-.05	.08	.06	-.12
Behavioral Domain	.30**	.25**	.42**	.31**	.13	.16*	.20**	.21**	.18*	-.01	.30**	-.00	-.01
Cognitive Domain	.28**	.26**	.27**	.29**	.16*	.20**	.21**	.15*	.21**	-.01	.17*	-.02	-.05
Dominance Domain	.28**	.30**	.25**	.20**	.21**	.22**	.25**	.26**	.25**	.08	.20**	.15*	.09
Emotional Domain	.32**	.33**	.24**	.21**	.25**	.30**	.28**	.29**	.31**	.02	.24**	.15*	.04
Self Domain	.14*	.12	.20**	0.06	.06	.06	.20**	.22**	.18*	.05	.21**	.10	.10
EPA Total	.34**	.27**	.38**	.24**	.23**	.22**	.32**	.47**	.34**	.20**	.36**	.27**	.25**
Antagonism	.34**	.40**	.22**	.27**	.28**	.29**	.24**	.23**	.34**	-.02	.16*	.10	-.08
Emotional Stability	.07	.06	.10	-.02	.03	.05	.15*	.29**	.03	.42**	.09	.25**	.44**
Disinhibition	.27**	.18*	.41**	.24**	.12	.17*	.21**	.29**	.26**	.02	.36**	.06	.04
Narcissism	.17*	0.03	.23**	0.09	.18*	.03	.24**	.45**	.27**	.18*	.30**	.40**	.35**
SRP Total	.36**	.35**	.37**	.29**	.19**	.27**	.30**	.35**	.27**	.13	.30**	.16*	.10
Interpersonal Manipulation	.29**	.30**	.26**	.24**	.18*	.22**	.27**	.20**	.18*	.09	.14	.12	.06
Callous Affect	.28**	.35**	.21**	.19**	.17*	.28**	.22**	.28**	.28**	.14	.16*	.16*	.09
Erratic Lifestyle	.33**	.25**	.43**	.29**	.15*	.21**	.28**	.40**	.23**	.14	.43**	.16*	.14
Criminal Tendencies	.13	.14	.17*	.12	.06	.06	.09	.11	.12	-.00	.11	.04	-.03
TriPM Total	.28**	.23**	.36**	.21**	.17*	.18*	.25**	.41**	.23**	.24**	.31**	.26**	.30**
Boldness	.05	-0.01	0.10	-.03	.04	-.02	.13	.38**	.04	.43**	.16*	.37**	.59**
Meanness	.26**	.32**	.24**	.19**	.17*	.22**	.17*	.30**	.27**	.11	.22**	.16*	.07
Disinhibition	.29**	.20**	.40**	.28**	.15*	.18*	.21**	.16*	.18*	-.07	.25**	-.01	-.09

Note. CAPP = Comprehensive Assessment of Psychopathy; EPA = Elemental Psychopathy Assessment; SRP = Self-Report Psychopathy Scale; TriPM = Triarchic Psychopathy Measure. *$p < .05$, **$p < .01$, ***$p < .001$.

Table B4

Cross Method Fear Correlation Matrix

Scale	1	2	3	4	5	6	7	8	9	10	11
Adolescent Invulnerability Scale	–										
Fear Survey Schedule	-.29**	–									
Fear Questionnaire	-.19**	.64**	–								
MPQ−Harm Avoidance	-.47**	.40**	.30**	–							
PID5−Risk Taking	.49**	-.39**	-.30**	-.59**	–						
SSS−Thrill and Adventure Seeking	.33**	-.30**	-.29**	-.58**	.61**	–					
Sensitivity to Punishment	-.30**	.58**	.53**	.38**	-.38**	-.36**	–				
Trait Anxiety	-.17**	.44**	.38**	.19**	-.14*	-.18	.61**	–			
IFear Questionnaire	-.13	.28**	.24**	.07	-.07	-.09	.26**	.29**	–		
IMPQ−Harm Avoidance	-.03	-.11	-.04	-.09	-.04	-.06	-.04	-.08	.04	–	
ISSS−Thrill and Adventure Seeking	.28**	-.23**	-.30**	-.41**	.48**	.59**	-.36**	-.22**	-.25**	-.15*	–

Note. PID-5 = Personality Inventory for DSM-5; MPQ−HA = Multidimensional Personality Questionnaire; SSS = Sensation Seeking Scale; I = Informant.
*$p < .05$, **$p < .01$, ***$p < .001$.

Table B5

Self-Report Psychopathy and Fear Correlation Matrix

Scale	AIS	FSS	FQ	MPQ−HA	PID5−RT	SSS−TAS	SP	STAI−T
CAPP Total	.43**	-.00	.02	-.20**	.36**	.14*	.12*	.31**
Attachment Domain	.32**	.02	.03	-.05	.10	-.02	.16**	.24**
Behavioral Domain	.34**	.02	.04	-.19**	.39**	.18**	.13*	.29**
Cognitive Domain	.20**	.12*	.14*	-.06	.19**	.01	.26**	.35**
Dominance Domain	.42**	-.08	-.09	-.22**	.33**	.18**	.01	.18**
Emotional Domain	.41**	-.10	.01	-.22**	.35**	.11	.04	.30**
Self Domain	.40**	.01	-.01	-.21**	.37**	.21**	.03	.17**
EPA Total	.58**	-.20**	-.15**	-.40**	.57**	.32**	-.26**	-.04
Antagonism	.41**	-.01	.05	-.14*	.22**	.04	.08	.23**
Emotional Stability	.47**	-.52**	-.44**	-.38**	.39**	.30**	-.68**	-.72**
Disinhibition	.36**	.05	.07	-.28**	.50**	.27**	.07	.32**
Narcissism	.39**	-.20**	-.23**	-.32**	.45**	.28**	-.37**	-.14*
SRP Total	.57**	-.17**	-.13*	-.42**	.53**	.29**	-.12*	.12*
Interpersonal Manipulation	.45**	-.12*	-.12*	-.29**	.29**	.15*	-0.08	.12*
Callous Affect	.56**	-.23**	-.16**	-.32**	.44**	.19**	-.12*	.08
Erratic Lifestyle	.46**	-.18**	-.17**	-.46**	.70**	.43**	-.18**	.06
Criminal Tendencies	.29**	.04	.07	-.19**	.16**	.09	.01	.15**
TriPM Total	.62**	-.25**	-.23**	-.44**	.59**	.43**	-.33**	-.08
Boldness	.54**	-.55**	-.50**	-.51**	.53**	.51**	-.72**	-.58**
Meanness	.49**	-.12*	-.08	-.27**	.39**	.25**	-.11	.11*
Disinhibition	.26**	.19**	.13*	-.11	.29**	.13*	.19**	.35**

Note. CAPP = Comprehensive Assessment of Psychopathy; EPA = Elemental Psychopathy Assessment; SRP = Self-Report Psychopathy Scale; TriPM = Triarchic Psychopathy Measure; AIS = Adolescent Invulnerability Scale; FSS = Fear Survey Schedule; MPQ−HA = Multidimensional Personality Questionnaire−Harm Avoidance, Personality Inventory for DSM-5−Risk Taking; Sensation Seeking Scale−Thrill and Adventure Seeking; SP = Sensitivity to Punishment; STAI−T = State Trait Anxiety Inventory−Trait Scale.

*$p < .05$, **$p < .01$, ***$p < .001$.

Table B6

Informant Psychopathy and Fear Correlations Matrix

Scale	Fear Questionnaire	MPQ−Harm Avoidance	SSS−Thrill and Adventure Seeking
CAPP Total	.18*	.01	.05
CAPP Attachment Domain	.14*	-.05	-0.1
CAPP Behavioral Domain	.18*	-.04	.19**
CAPP Cognitive Domain	.20**	.01	.02
CAPP Dominance Domain	0.1	.00	.01
CAPP Emotional Domain	.16*	.01	-0.1
CAPP Self Domain	.14	.08	.11
EPA Total	-.12	-.02	.31**
EPA Antagonism	.07	.06	-.06
EPA Emotional Stability	-.35**	-.03	.33**
EPA Disinhibition	.06	-.08	.25**
EPA Narcissism	-.16*	.02	.27**
TriPM Boldness	-.50**	-.08	.52**

Note. CAPP = Comprehensive Assessment of Psychopathy; EPA = Elemental Psychopathy Assessment; TriPM = Triarchic Psychopathy Measure; MPQ−HA = Multidimensional Personality Questionnaire; SSS = Sensation Seeking Scale.
*$p < .05$, **$p < .01$, ***$p < .001$.

Table B7

Self-Report Psychopathy and Informant Fear Correlations Matrix

Scale	Fear Questionnaire	MPQ−Harm Avoidance	SSS−Thrill and Adventure Seeking
CAPP Total	.08	.02	.03
Attachment Domain	.15	.01	-.11
Behavioral Domain	.05	-.05	.09
Cognitive Domain	.02	.02	-.07
Dominance Domain	.02	.04	.04
Emotional Domain	.10	.05	.05
Self Domain	.06	.02	.15*
EPA Total	-.06	-.01	.24**
Antagonism	.13	.04	-.06
Emotional Stability	-.25	-.03	.29**
Disinhibition	.09	-.09	.17*
Narcissism	-.21	.10	.25**
SRP Total	.04	-.00	.16*
Interpersonal Manipulation	.08	.06	.06
Callous Affect	.01	.08	.08
Erratic Lifestyle	.00	-.05	.25**
Criminal Tendencies	.03	-.12	.07
TriPM Total	-.05	-.05	.35**
Boldness	-.29	.03	.49**
Meanness	.11	-.05	.13
Disinhibition	.10	-.08	.09

Note. CAPP = Comprehensive Assessment of Psychopathy; EPA = Elemental Psychopathy Assessment; SRP = Self-Report Psychopathy Scale; TriPM = Triarchic Psychopathy Measure; MPQ−HA = Multidimensional Personality Questionnaire; SSS = Sensation Seeking Scale.
*$p < .05$, **$p < .01$, ***$p < .001$.

Table B8

Informant Psychopathy and Self-Report Fear Correlations Matrix

Scale	AIS	FSS	FQ	MPQ−HA	PID5−RT	SP	SSS−TAS	STAI−T
CAPP Total	.18*	-.12	-.07	-.14	.19**	-.02	-.06	.11
CAPP Attachment Domain	.18*	-.09	-.09	-.05	0.09	-.09	-.01	.11
CAPP Behavioral Domain	.24**	-.10	-.09	-.19**	.36**	.12	-.09	.11
CAPP Cognitive Domain	.11	-.10	-.02	-.12	.11	-.04	.01	.13
CAPP Dominance Domain	.08	-.07	-.03	-.03	.07	-.12	-.03	.10
CAPP Emotional Domain	.12	-.14	-.07	-.13	.14	.00	-.01	.14
CAPP Self Domain	.18*	-.09	-.07	-.16*	.21**	.02	-.14*	-.02
EPA Total	.29**	-.20**	-.22**	-.29**	.39**	.18*	-.32**	-.18*
EPA Antagonism	.15*	-.08	-.06	-.11	.16*	-.05	-.10	.04
EPA Emotional Stability	.21**	-.14	-.26**	-.21**	.25**	.29**	-.29**	-.36**
EPA Disinhibition	.23**	-.13	-.12	-.25**	.36**	.16*	-.15*	.05
EPA Narcissism	.15*	-.17*	-.17*	-.15*	.21**	.06	-.31**	-.26**
TriPM Boldness	.28**	-.26**	-.31**	-.28**	.31**	.33**	-.41**	-.38**

Note. CAPP = Comprehensive Assessment of Psychopathy; EPA = Elemental Psychopathy Assessment; SRP = Self-Report Psychopathy Scale; TriPM = Triarchic Psychopathy Measure; AIS = Adolescent Invulnerability Scale; FSS = Fear Survey Schedule; MPQ−HA = Multidimensional Personality Questionnaire−Harm Avoidance, Personality Inventory for DSM-5−Risk Taking; Sensation Seeking Scale−Thrill and Adventure Seeking; SP = Sensitivity to Punishment; STAI−T = State Trait Anxiety Inventory−Trait Scale.

*$p < .05$, **$p < .01$, ***$p < .001$.